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(NATURAL HISTORY)

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THE MEALY-BUGS (PSEUDOCOCCIDAE : HOMOPTERA) DESCRIBED BY W. J. HALL, F. LAING AND A. H. STRICKLAND FROM THE ETHIOPIAN REGION

4

D. J. WILLIAMS

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BY

D. J. WILLIAMS

Commonwealth Institute of Entomology

Pp. 1–37 ; 15 *Text-figures*

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THE MEALY-BUGS (PSEUDOCOCCIDAE : HOMOPTERA) DESCRIBED BY W. J. HALL, F. LAING AND A. H. STRICKLAND FROM THE ETHIOPIAN REGION

By D. J. WILLIAMS

Commonwealth Institute of Entomology

THIS paper is one of a series to describe and illustrate, where necessary, all the mealy-bugs of the Ethiopian Region. The work is being undertaken jointly by the writer and by Mr. G. De Lotto of the Department of Agriculture, Nairobi, Kenya. One paper has already appeared by De Lotto (1957) dealing with the species described by James from East Africa and another has been completed (Williams, 1958) on the species described by Maskell, Newstead, Cockerell and Green from the Ethiopian Region.

Altogether twenty-three species are herein discussed, of which eighteen are regarded as valid and of these, illustrations are given of fifteen. Excellent illustrations of the remaining three species have been given already by other authors and these will be mentioned in the appropriate places. The redescription in each case is based on the holotype and type material held in the British Museum (Natural History). Following the system in my earlier paper, no attempt will be made, in this instance, to erect new genera as the main purpose is to redescribe the species. A species will be placed in a different known genus, however, should this be thought necessary. The terms used are those in current use and are drawn mainly from Ferris (1950), Ezzatt & McConnell (1956) and Borkhsenius (1949). Although many of the species discussed are known from the original discovery only, a few have been collected in other localities in recent years. No attempt is made here to list all localities and hosts as it is hoped to incorporate this aspect in a final revision of the Pseudococcidae.

I am indebted to Mr. G. De Lotto for kindly comparing material of *Antonina indica panica* Hall with the related species described by Brain.

THE SPECIES DESCRIBED BY W. J. HALL

Hall described five mealy-bugs from Southern Rhodesia and two from South Africa. One of these, *Trionymus pterocauloni*, described from Southern Rhodesia, is here regarded as being identical with *T. sanguineus* James. Hall (1937) recorded *Trionymus masrensis* Hall from Southern Rhodesia but this material is not the same as the type from Egypt. An interesting species described by Hall (1941) as *Molluscococcus fibrillae* from Southern Rhodesia and listed as a Pseudococcine form is here considered to belong to the family Dactylopiidae, recently defined by Ferris (1955*a*). Two species described from Egypt, *Antonina indica panica* and *Phenacoccus inermis* are discussed because the latter is here recorded from the Republic of the Sudan and the former was recorded by Hall (1937) from Southern Rhodesia.

Antonina indica panica Hall

Antonina indica var. *panica* Hall, 1925, *Bull. Minist. Agric. Egypt*, **64** : 6.
Antonina indica var. *panica* Hall, 1937, *Trans. R. ent. Soc. Lond.* **86** : 125.

Hall described this species from Egypt on *Panicum turgidum* and later recorded it from Theydon, Southern Rhodesia on the roots of *Eragrostis* sp. near *chalcantha.* It seems probable that it is the same as a species described by Brain from South Africa. Mr. De Lotto, who is reviewing the species described by Brain will deal with this question in a future paper.

Mirococcus inermis (Hall)

(Text-fig. 1)

Phenacoccus inermis Hall, 1925, *Bull. Minist. Agric. Egypt*, **64** : 7.
Mirococcus inermis (Hall), Borkhsenius, 1947, *Proc. Acad. Sci. Armen. S.S.R.* **7** : 142.

HABIT. Originally described by Hall from material collected near Helwan, Egypt, on the roots of *Cleome arabica*, *Cressa cretica*, *Frankenia pulverulenta* and *Zygophyllum simplex*. It has since been recorded throughout North Africa and Borkhsenius (1949) has recorded the species from Ukraine, Armenia, Azerbaijan, Uzbekistan and Tadjikistan in the U.S.S.R. Material is at hand from the Ethiopian Region collected at Khartoum, Sudan on *Portulaca* sp. Hall gives the following description of the external appearance : " Naples-yellow in colour, covered somewhat sparsely but uniformly with white pulverulent secretionary matter. Marginal filaments wanting. Skin delicate."

RECOGNITION CHARACTERS. The shape of the adult female varies considerably according to the age of the individual. In the young adult the shape is elongate-oval but later becomes more rounded and some specimens become globose ; older specimens attaining a length of 3·5 mm. Posterior end of body rounded, anal lobes obsolete. Antennae short, 9-segmented, the terminal segment rounded. Legs short and slender, with a denticle on the plantar surface of the claw. Circulus rather large. Ostioles poorly developed with three or four trilocular pores and an occasional seta on each lip. Anal ring with six setae which are slightly shorter than the diameter of the ring. The outer ring is composed of small pores giving the whole ring a narrow appearance. Cerarii absent. Dorsal setae all short and slender, not numerous. Multilocular disc pores distributed over dorsum, scattered on head and thorax but they occupy transverse rows on the abdomen. Tubular ducts small, of the oral collar type, present on the abdomen only where they are sparse and are arranged more or less in transverse rows, there being scarcely more than ten on any

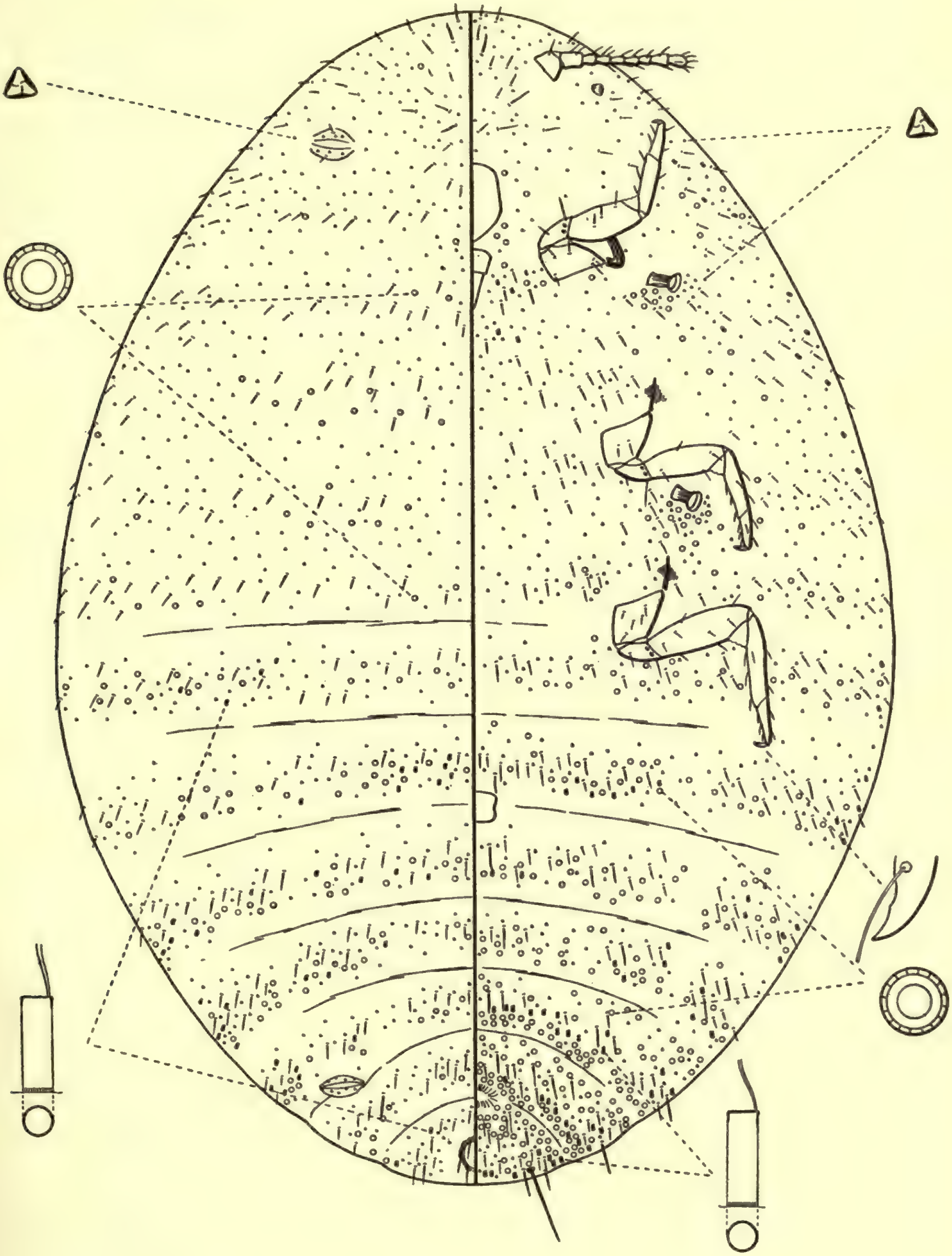

FIG. 1.

one segment and usually less on the posterior segments. Trilocular pores few, evenly distributed.

Ventral surface with a pair of long, stout, apical setae. Ventral setae having a similar distribution to those on the dorsum but they tend to be longer, especially on the posterior segments. Multilocular disc pores scattered on the head and thorax but there is a noticeable group posterior to each spiracle. On the abdomen they lie in transverse rows and lateral groups and are more numerous than on the dorsum. Tubular ducts sparse on the thorax where they are present mainly on the margins and between the first legs. They form transverse rows on the abdominal segments and become more numerous posteriorly. Trilocular pores evenly but sparsely distributed.

NOTES. This species has been made the type of the genus *Mirococcus*. The total absence of cerarii, the 9-segmented antennae and the denticle on the claw serve to distinguish the species.

Octococcus pentziae Hall

(Text-fig. 2)

Octococcus pentziae Hall, 1939, *J. ent. Soc. S. Afr.* **2** : 93.

HABIT. Described from Grootfontein School of Agriculture, Middelburg, Cape, South Africa on *Pentzia* sp. (Compositae). Hall gives the following description of the insect in life : " Adult female enclosed in a closely felted sac which is white or more often dirty white on account of extraneous matter which has become incorporated. The sac is broadly ovoid and convex, almost globular, with a small orifice towards one extremity."

RECOGNITION CHARACTERS. A small oval species rarely exceeding 1·5 mm. in length. Antennae 9-segmented. Legs long and slender with a few translucent pores on the hind coxae. Small conical setae are situated on the coxae, trochanters and tibiae of the second and third pairs of legs. Claw with a minute denticle. Circulus absent. Ostioles poorly developed, there being a posterior pair only, each of which is in the form of a narrow slit with sclerotized lips. Anal ring with six setae which are about one and a half times as long as the diameter of the ring. The anal ring is often located at a short distance from the apex of the body and as the cisanal setae are of similar size and shape to the anal ring setae and lie very close to the posterior end of the ring, the impression is given of a ring with eight setae. Cerarii confined to the two posterior segments. Anal lobe cerarii each composed of a pair of short conical setae accompanied by about four long stout blunt setae and two or three trilocular pores surrounded by an elongate sclerotized area. Penultimate cerarii each with two conical setae and two long auxiliary setae and with one or two trilocular pores, surrounded by a small oval area of sclerotization. Dorsal setae not numerous, of various sizes but all rather stout and blunt. The longer setae tend to be more numerous on the posterior abdominal segments. Dorsal multilocular disc pores absent. Tubular ducts of two sizes, the largest with an oral rim and with the duct of a large diameter. There is also another rim encircling the middle of the tube. These ducts are not numerous and occupy

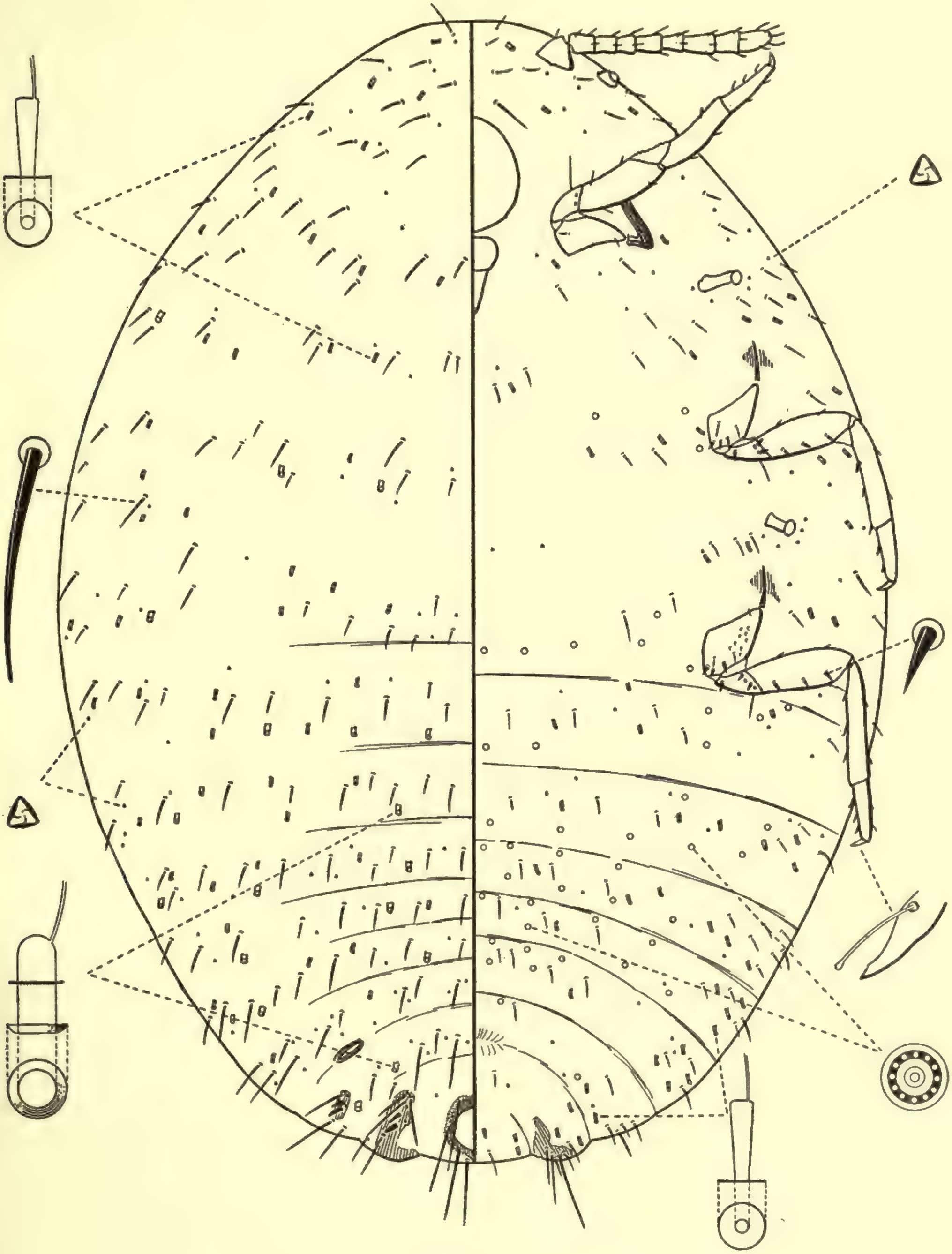

FIG. 2.

single transverse rows. The smaller type of duct is rather slender but has a wide flat oral rim which is not heavily sclerotized. They lie in transverse rows on the abdomen but become scattered on the thorax and head. Trilocular pores sparse.

Ventral surface with a curved area of sclerotization on the anal lobes which is continuous with the dorsal sclerotization. Apical setae slightly longer than anal ring setae. Ventral setae of various sizes but more slender than those on the dorsum, not numerous. Multilocular disc pores present mainly on the abdomen where they are situated in single transverse rows on the anterior and posterior edges of the segments. A few pores are located on the thorax. Tubular ducts similar to the small type on the dorsal surface, are present in no definite arrangement but they tend to occupy transverse rows on the abdomen. A few are present on the thorax especially around the margins. Trilocular pores not numerous.

NOTES. This species was made the type of the genus *Octococcus* Hall on the basis of the anal ring with eight setae. An examination of a number of specimens has shown that the two posterior setae are detached from the ring and are the cisanal setae which often lie on the dorsal surface when the ring is located even a short distance from the apex of the body. Hall has stated that the claw is without a denticle but in all the specimens seen there is a small but distinct denticle at the distal end. This is quite a distinctive species and there is no doubt that the genus is valid although another species *Puto africanus* Brain which Hall assigned to it does not seem to be congeneric.

Paracoccus proteae (Hall) ***(comb. nov.)***

(Text-fig. 3)

Pseudococcus proteae Hall, 1937, *Trans. R. ent. Soc. Lond.* **86** : 128.

HABIT. Described originally from Inyazura, Southern Rhodesia on *Protea* sp. Hall gave the following account of the species in life : " A small ovate species in which the brownish colour is obscured by a coating of white pulverulent matter. Four short and stout caudal filaments ; these are about 1/3 of the length of the body of the insect. A few successively shorter marginal filaments occur on the abdominal segments, but these are poorly developed in some individuals. Ovisac of indeterminate shape. Eggs very pale brown almost yellow."

RECOGNITION CHARACTERS. Adult female ovate, a rather small species measuring approximately 2·5 mm. × 1·5 mm. Antennae 8-segmented. Legs long and slender for the size of the insect. Dorsal ostioles well developed, the lips with a few setae and trilocular pores and the inner edges moderately sclerotized. Circulus absent. Anal ring with six setae, these longer than the diameter of the ring and longer than the cisanal setae. Dorsal surface with a reduced number of cerarii there being seven to nine pairs present. Each cerarius consists of two setae surrounded by a few trilocular pores and without auxiliary setae, the cerarian setae becoming more slender anteriorly so that the anteriormost resemble the other setae on the dorsum. Dorsal setae not numerous but all short and slender. Multilocular disc pores absent. Tubular ducts present of the oral rim type only, these arranged singly near the

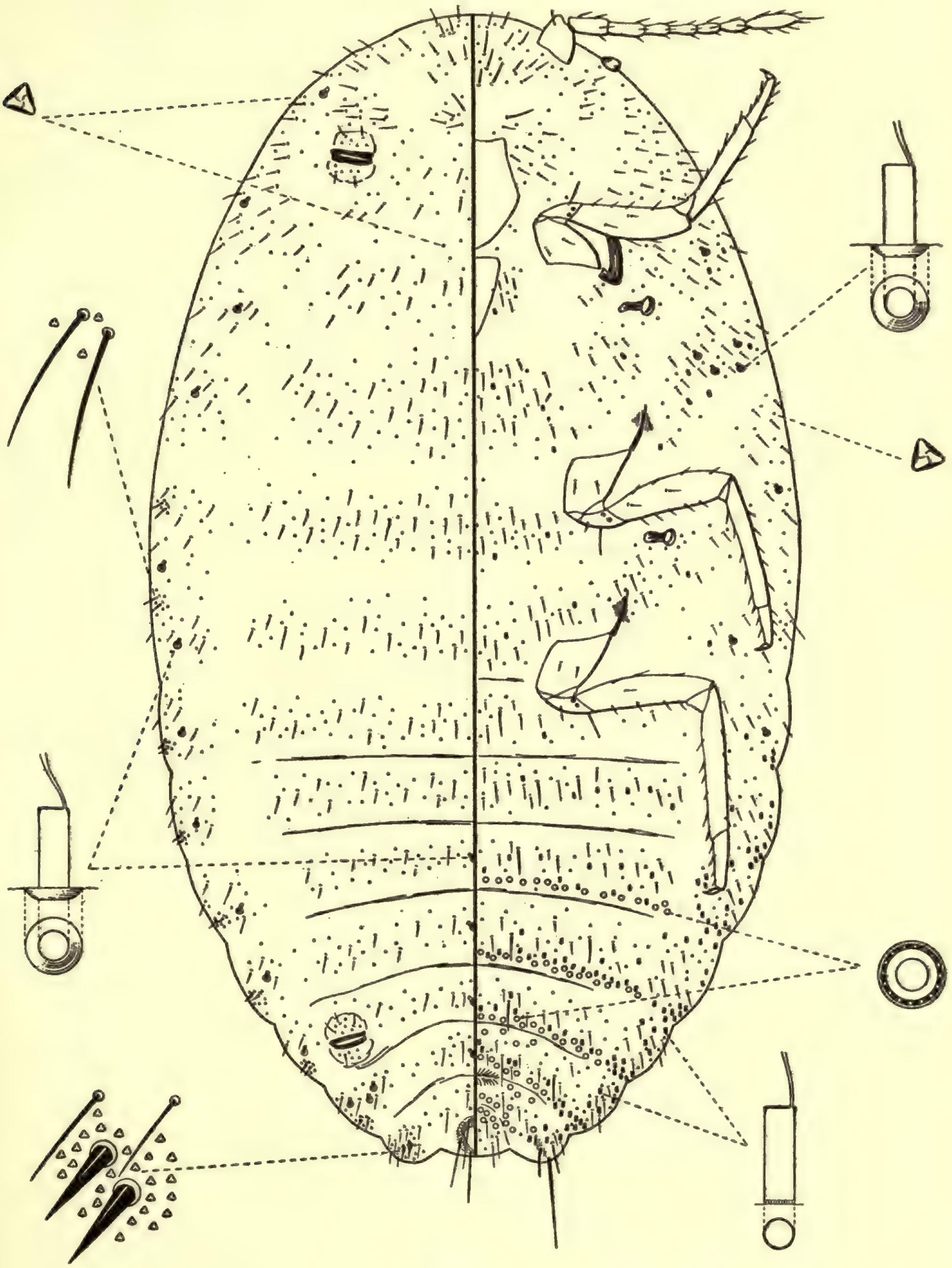

FIG. 3

margins of each segment except the last. The penultimate segment has usually a group of two or three. A single oral rim duct is usually situated in the mid-region of the fifth to eighth abdominal segments. Trilocular pores not numerous, evenly distributed.

Ventral surface with a small lightly sclerotized anal bar with a short bar seta. Apical setae detached from the bar. Ventral setae not numerous, of similar shape and size to those on the dorsum but on the abdomen and between the antennal bases there are longer setae present. Multilocular disc pores on the abdomen only, arranged in more or less single transverse rows at the posterior edges of the fourth and posterior segments. Ventral tubular ducts of two types. Some of the oral rims ducts similar to those on the dorsum are situated mainly in a submarginal zone on the thorax, there being usually a noticeable group lateral to the first spiracles. Smaller tubular ducts of the oral collar type are distributed on the prevulvar abdominal segments in transverse rows and also in marginal groups on all the abdominal segments. They are very sparse on the thorax and absent on the head. Trilocular pores not numerous, evenly distributed.

NOTES. This species seems to be referable to the genus *Paracoccus* Ezzatt & McConnell and belongs to the group with seven definite pairs of cerarii. It comes close to *P. solani* Ezzatt & McConnell described from Arizona both species lacking a circulus, but differs in possessing fewer dorsal oral rim ducts on the head and thorax.

Pseudococcus barleriae Hall

(Text-fig. 4)

Pseudococcus barleriae Hall, 1939, *J. ent. Soc. S. Afr.* **2** : 96.

HABIT. Described from Pretoria, South Africa on *Barleria macrostegia* (Acanthaceae), in the curled leaves at the end of twigs. Hall gives the following description of the habit : " Adult female small and rarely exceeding 1·5 mm. in length, oval in shape, pale brown in colour and sparsely coated with white pulverulent matter. No marginal or caudal filaments apparent. Eggs yellow and in some individuals they were observed to emerge joined together like a string of sausages."

RECOGNITION CHARACTERS. Body of mounted female oval and measuring approximately 1·5 mm. long. Antennae 7-segmented. Legs normal except the hind coxae which are noticeably large in comparison to the other coxae, the junction of the coxae to the derm being rather indistinct ; each hind coxa and tibia with a number of translucent pores. Circulus absent. Ostioles represented by a poorly developed posterior pair only, with a few trilocular pores on each lip and apparently without setae. Hall has stated in his original description that the anterior pair is also present but this has not been seen in any of the specimens examined. Length of anal ring setae about one and a half times the diameter of the ring. Cerarii confined to the anal lobes although there is often a single cerarian seta on the penultimate segment. Anal lobe cerarius composed of two medium sized setae and a few trilocular pores ; one or two auxiliary setae are also present. Dorsal setae not numerous, all short and slender. Multilocular disc pores arranged in single trans-

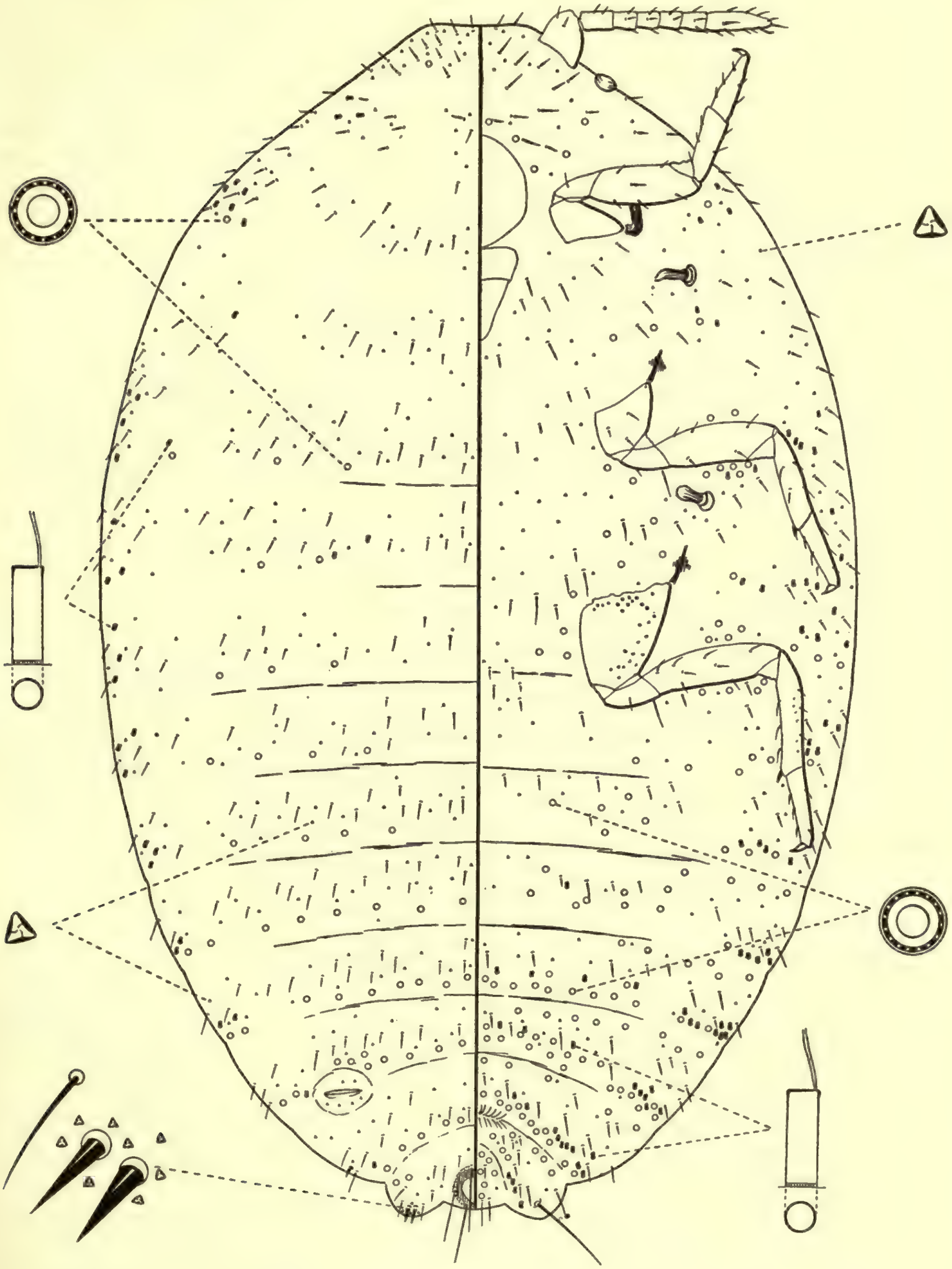

FIG. 4

verse rows at the posterior edges of the thoracic and abdominal segments. Dorsal tubular ducts, small and confined to the margins in small groups. Trilocular pores sparse following the pattern of the dorsal setae.

Ventral surface with a pair of apical setae, these nearly twice as long as the anal ring setae. Ventral setae rather sparse, short and slender but they tend to be longer than the dorsal setae. Multilocular disc pores scattered on the head and thorax where they are not numerous. On the anterior abdominal segments they are also scattered but posteriorly they lie in transverse rows on the anterior and posterior edges of the segments ; there are about twenty-five pores posterior to the vulva. Tubular ducts, similar to those on the dorsum, are present in transverse rows on the three prevulvar segments and apart from a few scattered ducts they are mainly arranged in submarginal groups on the thorax and abdomen. Trilocular pores sparse but evenly distributed.

NOTES. The distinctive features of this species are the 7-segmented antennae, the reduced number of cerarii, the distribution of the multilocular disc pores on both the dorsal and ventral surfaces and the rather large hind coxae. It does not belong to the genus *Pseudococcus* as now defined but it is retained in this genus for the time being until further study has been made of the African species.

Pseudococcus mazoeensis Hall

(Text-fig. 5)

Pseudococcus mazoeensis Hall, 1937, *Trans. R. ent. Soc. Lond.* **86** : 127.

HABIT. This species was described from Mazoe, Southern Rhodesia, on *Acacia* sp. (Leguminosae) and *Zizyphus jujuba* (Rhamnaceae). The habit is given by Hall as follows : " Adult female, globose, usually brown in colour but some individuals show a tinge of pink. It has a somewhat dense covering of white pulverulent matter which in old specimens has often been worn off to some extent. Marginal filaments confined to the abdominal region ; they are short and stout increasing in size towards the caudal extremity but even the caudal pair are short. Adult female viviparous."

RECOGNITION CHARACTERS. Adult female broadly oval, the older specimens attaining a length of 3 mm. Antennae 8-segmented. Legs rather short and stout with a few translucent pores on the hind coxae and tibiae. Circulus present, well developed. Ostioles large with the inner edges of the lips sclerotized and each lip with about three to six setae and a few trilocular pores. Anal ring with six setae, these about twice as long as the diameter of the ring. Cerarii confined to the last six abdominal segments, although there are sometimes seven present. Anal lobe cerarii usually composed of three conical setae surrounded by a number of trilocular pores. Penultimate cerarii each with about nine conical setae which vary in size. The cerarii of the seventh abdominal segment are similar to the penultimate but anteriorly they become smaller so that the anteriormost cerarii each have about five setae or less and a small number of trilocular pores. Dorsal surface beset with small slender setae. The only dorsal pores present are trilocular which are somewhat abundant, and also a few small circular disc pores.

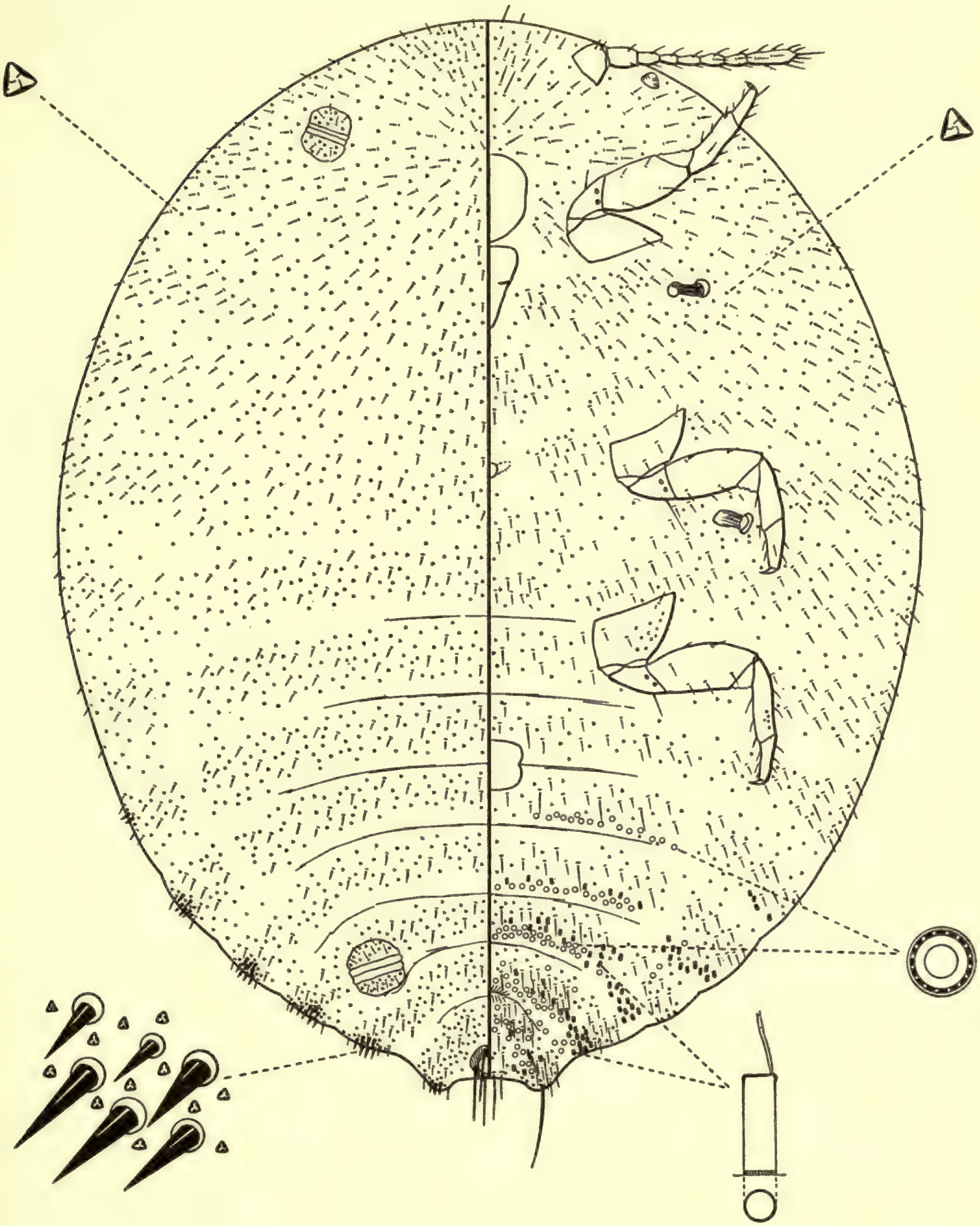

Fig. 5

Ventral surface with a faintly sclerotized anal lobe bar and a slender bar seta. The apical seta is detached from the bar and is about twice the length of the anal ring setae. There is apparently a pair of cisanal setae present which are nearly as long as the anal ring setae and also a shorter pair of obanal setae. Ventral setae rather numerous, of various sizes, mainly short and slender but they are generally longer than those on the dorsum. Multilocular disc pores on all segments posterior to the circulus. On the fifth and sixth segments they form single transverse rows but on the seventh and eighth segments they lie in double transverse rows and do not extend to the margins. Ventral tubular ducts of the oral collar type situated in transverse rows and lateral groups on the three prevulvar segments. On the fifth segment they form small lateral groups only and a few are present around the anal lobes. Trilocular pores evenly distributed, not so numerous as on dorsal surface. Small circular disc pores scattered.

NOTES. This species does not belong to the genus *Pseudococcus* as now understood and bears characters which link it with the genus *Cataenococcus* as recently described by Ferris (1955) and especially to *C. phoradendri* (Cockerell). It differs from all the known species of *Cataenococcus*, however, in having the anal ring located at the apex of the body instead of being set at about its own length from the apex of the body.

Pseudococcus rhodesiensis Hall

(Text-fig. 6)

Pseudococcus rhodesiensis Hall, 1937, *Trans. R. ent. Soc. Lond.* **86** : 130.

HABIT. This species was described from South Marendellas, Southern Rhodesia on grass roots. Hall gave the following description of the habit: "Adult female ovate to elongate oval and pale to bright yellow in colour. The segmentation is distinct and the dermis is sparsely dusted with a little white pulverulent matter. No marginal or caudal filaments apparent. Later the female becomes enclosed in a cell of white fibres of indeterminate shape, the inside of which is comparatively smooth and matted."

RECOGNITION CHARACTERS. Adult female as mounted on the slide, elongate-oval measuring approximately 3·5 mm. long, the posterior end of the body rounded. Antennae very short with either six, seven or eight segments. Legs small in comparison to the size of the body, claws without a denticle. Circulus absent. Anterior and posterior ostioles absent. Anal ring with six setae, their lengths being nearly twice as long as the diameter of the ring. Outer ring of anal ring pores rather numerous, giving the ring a wide appearance. Spiracles with wide apodemal plates but without a crescentic band of pores on the spiracular opening. Cerarii represented by a single pair on the anal lobes each usually composed of a single short conical seta surrounded by a few long stout auxiliary setae but without trilocular pores. Dorsal setae not numerous of various lengths but all slender and not lanceolate. Apart from the group of long auxiliary setae surrounding each anal lobe cerarius there is another group on the margin of the penultimate segment. A few other long marginal setae are present on some of the other abdominal segments.

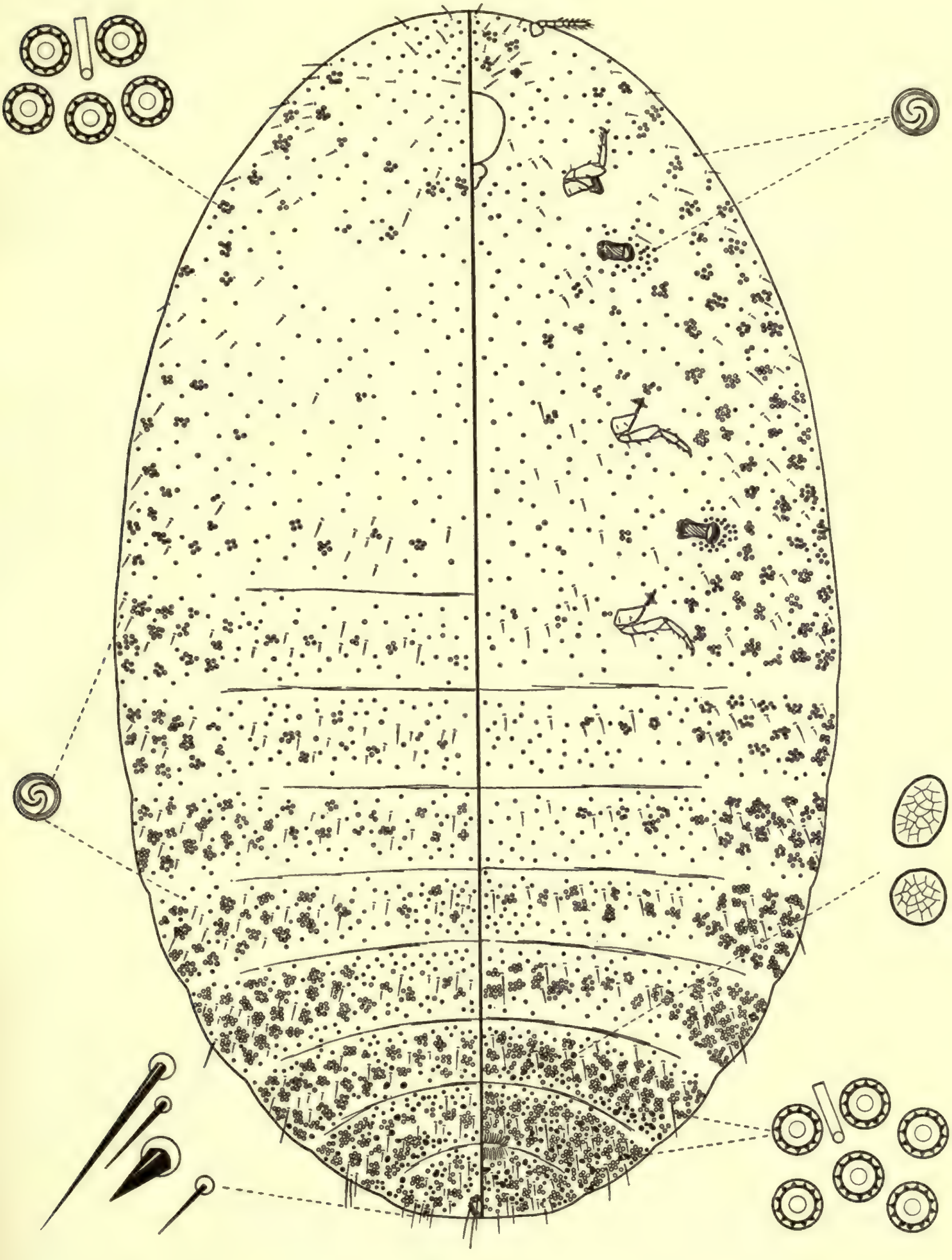

FIG. 6

Dorsal multilocular disc pores in groups of up to twelve ; numerous across the abdominal segments but present on the thorax mainly on the margins. Each group of pores surrounds a small slender tubular duct but there is often more than one duct present probably because the groups are merged. Single pores are often scattered between the groups. On the last three segments there is a variable number of sieve-like disc pores. These are usually larger than the multilocular disc pores and the shape varies from circular to oval. Trilocular pores about the same size as the multilocular disc pores, always round ; usually distributed along the anterior and posterior margins of the abdominal segments. They are sparser on the thorax and head. Small circular disc pores scattered.

Ventral surface with a few long setae on the margins of the abdominal segments. Other setae short and slender, not numerous. Multilocular disc pores in similar groups to those on the dorsal surface ; numerous in transverse rows on the abdomen and around the margins. Sieve-like disc pores present on the three posterior segments. Trilocular pores more numerous than on the dorsum there being noticeable concentrations around the spiracular openings. Small circular disc pores present in no definite arrangement.

NOTES. The groups of multilocular disc pores each surrounding a slender tubular duct would suggest a relationship with the genus *Peliococcus* Borkhsenius. Nevertheless this genus belongs to the *Phenacoccus* series with 9-segmented antennae, with a denticle on the claw and with ventral quinquelocular pores. As *rhodesiensis* has none of these characters and as it possesses sieve-like disc pores on the abdomen and spiracles with rather wide apodemal plates it may be that it has some relationship, however remote, to the grass feeding genera centred around *Antonina* Signoret and *Antoninoides* Ferris. It is significant that *Antoninoides parrotti* (Cockerell) has extremely small antennae and legs similar to those of *rhodesiensis*.

Trionymus inyazurae Hall

(Text-fig. 7)

Trionymus inyazurae Hall, 1937, *Trans. R. ent. Soc. Lond.* **86** : 131.

HABIT. Originally described from Inyazura, Southern Rhodesia on grass just underground at the base of the aerial shoots. Hall notes the external appearance as follows : " Adult female ovate, pale brown to maroon, but the colour is somewhat obscured by a very fine and uniform film of white pulverulent matter. Segmentation distinct. There are no marginal filaments, and in the absence of these the four very short caudal filaments are readily seen. Ovisac of indeterminate form but composed of fibres that are capable of being drawn out to a considerable length.

Eggs pale brown. Young adult females are relatively elongate filling out and becoming more ovate later."

RECOGNITION CHARACTERS. Adult female in prepared specimens, ovate and measuring approximately 2·5 mm. long. Posterior edge of body rounded. Antennae 8-segmented. Legs normal, rather slender with a few translucent pores on hind coxae. Circulus absent. Anterior and posterior ostioles moderately developed,

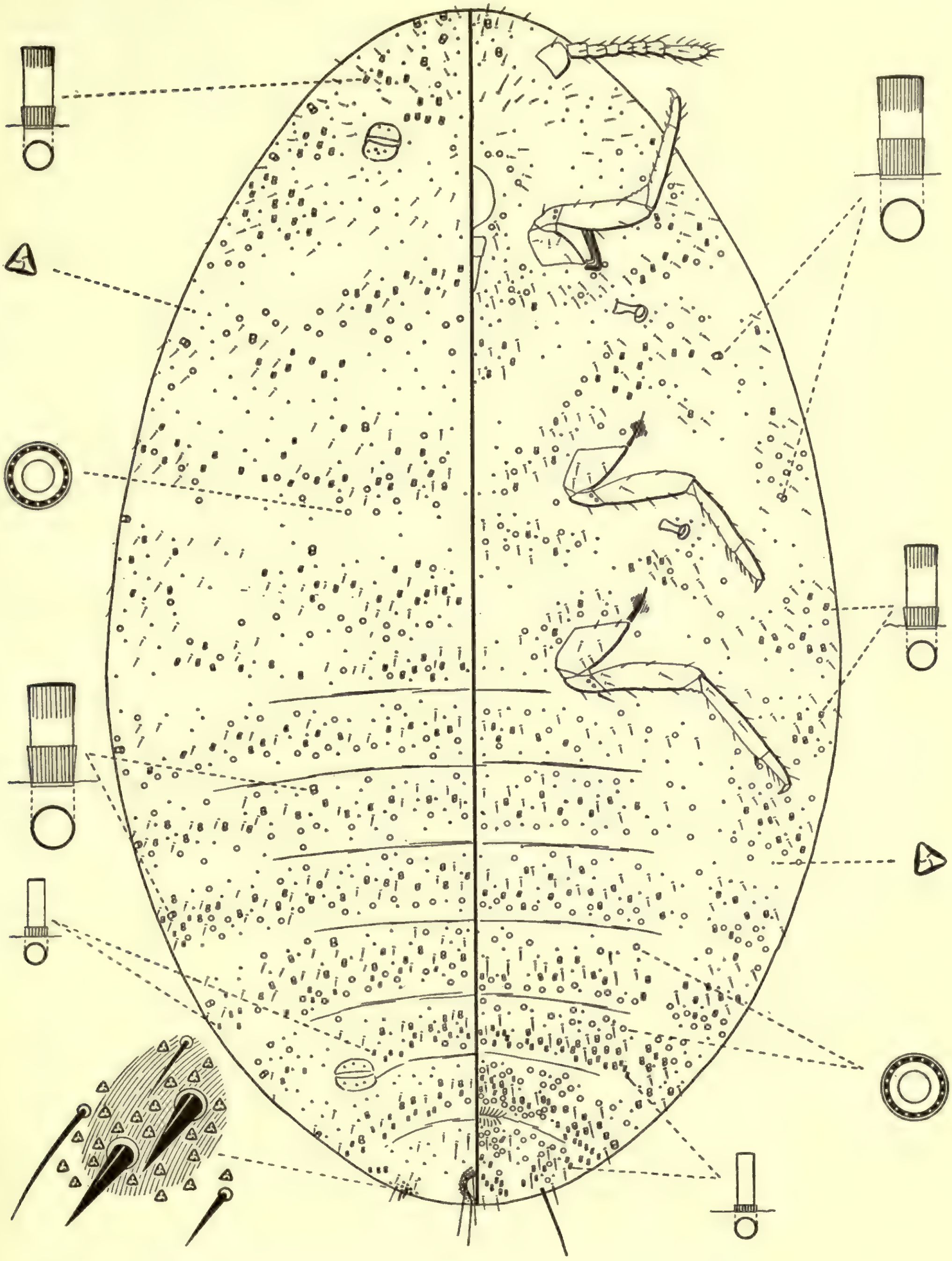

FIG. 7

the lips with a few trilocular pores but apparently without setae. Anal ring with six setae, the lengths of which are nearly twice the diameter of the ring. Cerarii confined to the anal lobes only, each consisting of two small conical setae surrounded by a small cluster of trilocular pores and three or four short, slender, auxiliary setae surrounded by a lightly sclerotized area. Dorsal setae evenly distributed, not numerous and all short and slender. Multilocular disc pores present on the dorsum, these rather scattered on the head and thorax but on the abdomen they are distributed in transverse rows at the anterior and posterior edges of the segments ; they are absent on the last segment. Tubular ducts distributed over entire dorsum, of three sizes all of the oral collar type. A large type, few in number, is distributed mainly on the anterior head region and singly on the margins ; other single ducts are present on the dorsum but these are not constant in number or position. An intermediate size present over entire dorsum, rather numerous and arranged more or less in transverse rows across the segments. Small tubular ducts on the last four segments only, these in transverse rows at the posterior edges of the segments except the last where there is a small marginal group, the latter being the only ducts on the last segment. Trilocular pores not numerous but evenly distributed.

Ventral surface with a pair of apical setae which are stouter and longer than the anal ring setae. Ventral setae similar to those on dorsum. Multilocular disc pores rather numerous on the abdomen at the anterior and posterior edges of the segments, becoming less numerous anteriorly on the thorax. They are sparse on the head. Tubular ducts of the same three sizes as those on the dorsum. An occasional duct of the large type is present on the margins and on the anterior head region. The intermediate size duct is the most numerous, these scattered on the thorax, but on the abdomen they lie in transverse rows and lateral groups. Numerous small tubular ducts confined to the last three segments. Trilocular pores sparse.

NOTES. This species does not seem to be a typical *Trionymus* but it bears a close similarity to *T. magnus* (Cockerell & Cockerell) known only from North West Mexico and recently redescribed by Ferris (1953). The latter species has been placed in *Trionymus* but it differs from *inyazurae* mainly in having a small circulus and 7-segmented antennae instead of 8-segmented antennae. It is significant that *inyazurae* is a grass-feeding species, as are most species of *Trionymus*.

Trionymus pterocauloni Hall = ***Trionymus sanguineus*** James (SYN. NOV.)

Trionymus pterocauloni Hall, 1937, *Trans. R. ent. Soc. Lond.* **86** : 133.

This species was described by Hall from Salisbury, Southern Rhodesia on *Pterocaulon decurrens* and *Trifolium* sp. It is identical, however, with *Trionymus sanguineus* described by James (1936) to which the name *Trionymus pterocauloni* Hall is here sunk as a synonym. De Lotto (1957) has already redescribed *sanguineus* and given an illustration.

THE SPECIES DESCRIBED BY F. LAING

Seven species have been described from the Ethiopian Region by Laing at one time or another. Two names have been sunk as synonyms already and a further name is synonymized herein. Ezzatt & McConnell (1956) have redescribed and illustrated *Planococcoides njalensis*. In the accompanying pages, illustrations and descriptions are given of *Heliococcus phaseoli*, *Pseudococcus hargreavesi* and *Pseudococcus ugandae*.

Heliococcus phaseoli (Laing)

(Text-fig. 8)

Phenacoccus phaseoli Laing, 1929, *Ann. Mag. nat. Hist.* (10) **4** : 475.
Heliococcus phaseoli (Laing), Goux, 1934, *Bull. soc. ent. Fr.* **39** : 171.

HABIT. This species was described from Hill Station, Sierra Leone on dwarf beans. Laing was unable to give any description of the external appearance as the specimens were preserved in alcohol.

RECOGNITION CHARACTERS. Adult female ovate measuring approximately 3·5 mm. long. Anal lobes moderately sclerotized on the dorsal surface. Antennae 9-segmented. Legs stout and long, with a denticle on the claw. Circulus rather large and wide. Ostioles moderately developed, each lip with about two setae and a few trilocular pores. Anal ring with six setae, these being slightly longer than the diameter of the ring. Cerarii numbering thirteen pairs and borne at the apices of small membranous tubercles. There is a cerarius on the margin of each abdominal segment and the remaining cerarii are situated evenly on the margins of the thorax and head. Each cerarius composed of a pair of lanceolate setae surrounded by a few trilocular pores. Dorsal surface with minute lanceolate setae which are quite sparse. Dorsal multilocular disc pores numerous, in definite transverse rows on all abdominal segments except the last, on the three thoracic segments and one row on the head. Crateriform ducts present in transverse rows, these being of three sizes. There are two pairs of large crateriform ducts on the anal lobes, each duct having three or four setae around the base of the duct prominence. Intermediate sized crateriform ducts are situated mainly in groups of two or three around the margins and an occasional duct is present in the mid-region. These ducts have three, or occasionally four, setae around the base of the duct prominence. Small crateriform ducts each with a single seta at the base of the duct prominence are present in single transverse rows on the abdomen whilst on the head and thorax they form irregular rows. A few small tubular ducts of the oral collar type are present in marginal groups on the seventh and eighth segments. Trilocular pores not numerous, evenly distributed.

Ventral surface with a pair of long apical setae accompanied by two shorter setae. In some specimens there is a small area of faint sclerotization near each apical seta but this is indistinct. Ventral setae of various sizes, there being some long setae especially in the mid-region interspersed with shorter setae. Minute lanceolate setae similar to those on the dorsum are located around the margins. Multilocular disc pores numerous. On the abdominal segments they occupy dense transverse rows at the anterior and posterior edges of the segments and on the head and thorax they form irregular rows. Quinquelocular pores sparse, there being a few between the transverse rows of multilocular disc pores on the abdomen and groups between

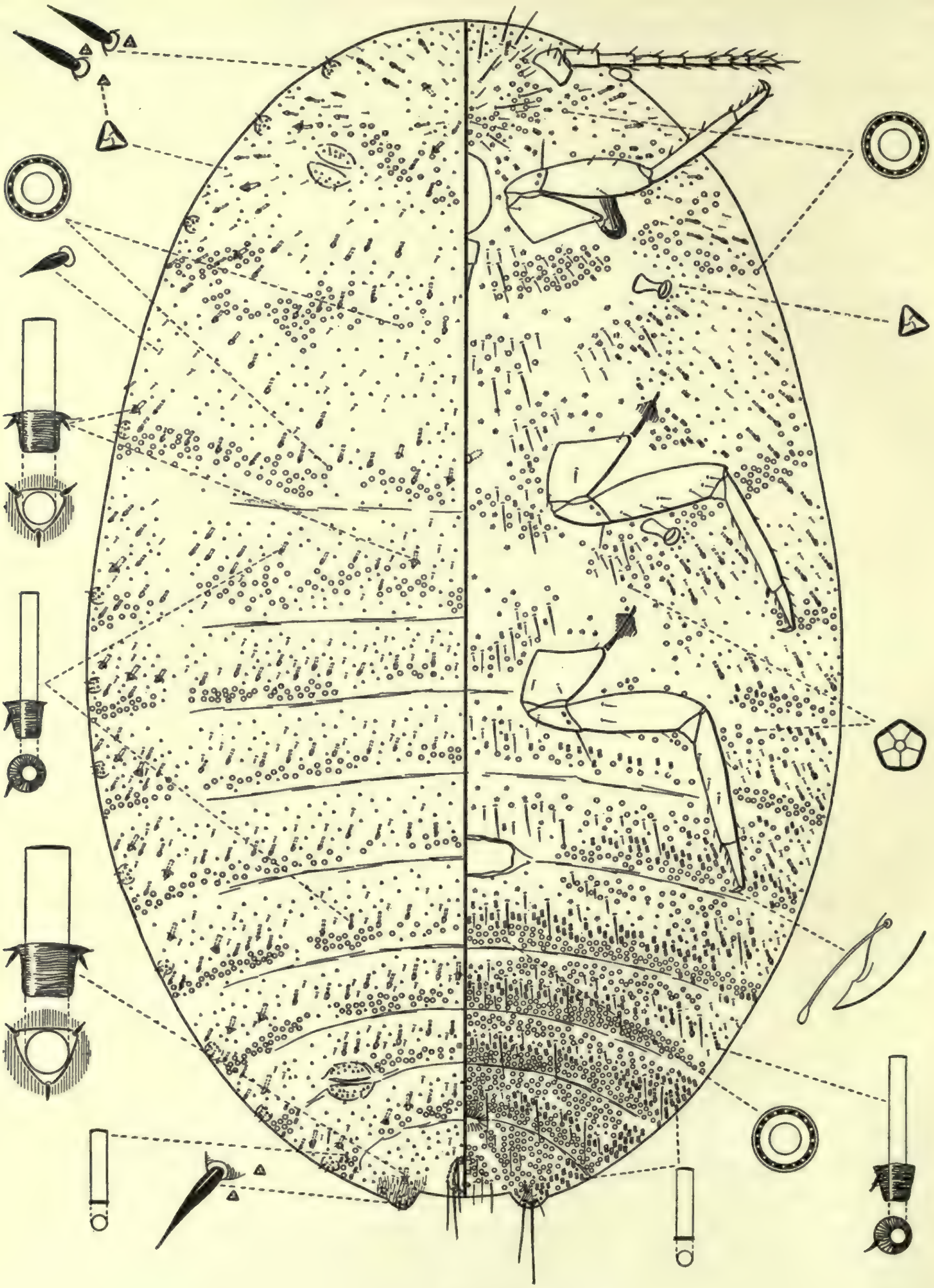

FIG. 8

the coxae. Small crateriform ducts similar to the small type on the dorsal surface are distributed around the margins but they are not numerous. There are noticeable groups posterior to each spiracle. Small oral collar tubular ducts in transverse rows between the rows of multilocular disc pores on the abdomen. They are fairly numerous on the posterior segments but become fewer anteriorly ; a few are present between the coxae. Trilocular pores sparse.

NOTES. Goux (1934) included this species in the genus *Heliococcus* Sulc on the basis of the crateriform pores. It seems to belong to this genus although the type species has eighteen pairs of cerarii whilst *phaseoli* has only thirteen pairs. Borkhsenius (1949), however, has described a number of species with two to eighteen pairs of cerarii and it seems that the number can be variable.

Paraputo ritchiei Laing = ***Paraputo anomala*** (Newstead)

Paraputo ritchiei Laing, 1929, *Ann. Mag. nat. Hist.* (10) **4** : 473.

In an earlier paper of this series (Williams, 1958) it has been established that this species is identical with *Paraputo anomala* (Newstead) to which the name *ritchiei* was sunk as a synonym.

Planococcoides njalensis (Laing)

Pseudococcus njalensis Laing, 1929, *Ann. Mag. nat. Hist.* (10) **4** : 472.
Pseudococcus exitiabilis Laing, 1944, *Bull. ent. Res.* **35** : 91.
Pseudococcus njalensis Laing, Hall, 1945, *Bull. ent. Res.* **36** : 305.
Planococcoides njalensis (Laing), Ezzatt & McConnell, 1956, *Univ. Maryland Agric. Exp. Sta. Bull.* A—**84** : 55.

Laing described *njalensis* in 1929 from Sierra Leone and in 1944 described *exitiabilis* from Gold Coast. It has been shown by Hall (1945) that the latter name is a synonym of *njalensis* and that the species is extremely variable. Great interest has been shown in this species in recent years as it is a vector of the " Swollen Shoot " virus disease of cacao. It is probably widespread throughout West Africa and the reader is referred to the paper by Hall who discussed its distribution and host records. Ezzatt & McConnell (1956) have recently made it the type species of the genus *Planococcoides* and have given an excellent illustration.

Pseudococcus bukobensis Laing = ***Pseudococcus hargreavesi*** Laing

An examination of type material of *Pseudococcus bukobensis* Laing described in 1929 has shown that it is identical with *Pseudococcus hargreavesi* Laing described in 1925 and the synonymy is given in the discussion of the latter species.

Pseudococcus exitiabilis Laing = ***Pseudococcus njalensis*** (Laing)

As previously stated this species has been shown by Hall (1945) to be the same as *njalensis* and it is listed here purely for reference.

Pseudococcus hargreavesi Laing

(Text-fig. 9)

Pseudococcus hargreavesi Laing, 1925, *Bull. ent. Res.* **16** : 52.
Pseudococcus bukobensis Laing, 1929, *Ann. Mag. nat. Hist.* (10) **4** : 471 (SYN. NOV.).

HABIT. Described originally from Kampala, Uganda on *Bauhinia* sp. and again under *P. bukobensis* from Bukoba, Tanganyika Territory on coffee. In neither case is there any description of the insect in life due to the specimens having been preserved in alcohol.

RECOGNITION CHARACTERS. Body of adult female oval, attaining a length of 4 mm. Antennae 8-segmented. Legs long and slender without a denticle on the claw, hind coxae and tibiae with a few translucent pores. Circulus present. Ostioles moderately developed, with the inner edges of the lips slightly sclerotized and with two or three setae and a few trilocular pores on each lip. Anal ring with six setae which are nearly twice as long as the diameter of the ring. Spiracles with a rather short, broad, apodemal plate. Cerarii numbering eighteen pairs. Anal lobe cerarii each with about seven conical setae of various sizes, with a few trilocular pores and one or two auxiliary setae surrounded by a characteristic sclerotized area. Penultimate cerarii similar to anal lobe cerarii each surrounded by a smaller area of sclerotization. The anterior cerarii are each composed of a few conical setae, there being rarely less than four setae and sometimes as many as seven but their numbers vary in different specimens. Dorsal surface with minute lanceolate setae which are not numerous. Trilocular pores accompany these setae in definite areas only there being thus some areas devoid of pores and setae as illustrated. A few tubular ducts of the oral collar type are usually scattered on the thorax.

Ventral surface of anal lobes each with a small sclerotized anal bar and a long slender bar seta. The apical seta is detached from the bar and is stouter and longer than the anal ring setae. Ventral setae not lanceolate, mainly long and slender but not numerous. Multilocular disc pores present on all segments posterior to the circulus, situated in the mid-region in transverse rows. On the fifth and sixth segments they form single rows at the posterior edges and on the seventh and eighth segments they form double rows. There are a few pores on the anterior edge of the seventh segment and a more or less double row on the anterior edge of the eighth segment. They are numerous between the anal lobes. Tubular ducts in transverse rows on the fourth to eighth abdominal segments and in marginal groups from the thorax to the anal lobes. Trilocular pores sparse.

NOTES. an examination of type material of *Pseudococcus bukobensis* Laing has shown that it is the same as *P. hargreavesi* Laing and the former name is here sunk as a synonym. This is a distinctive species which seems to belong to the tribe Planococcini as defined by Ezzatt & McConnell (1956). The dorsal setae are typically lanceolate resembling those of the *Phenacoccus* series, nevertheless the antennae are 8-segmented and there is no denticle on the claw.

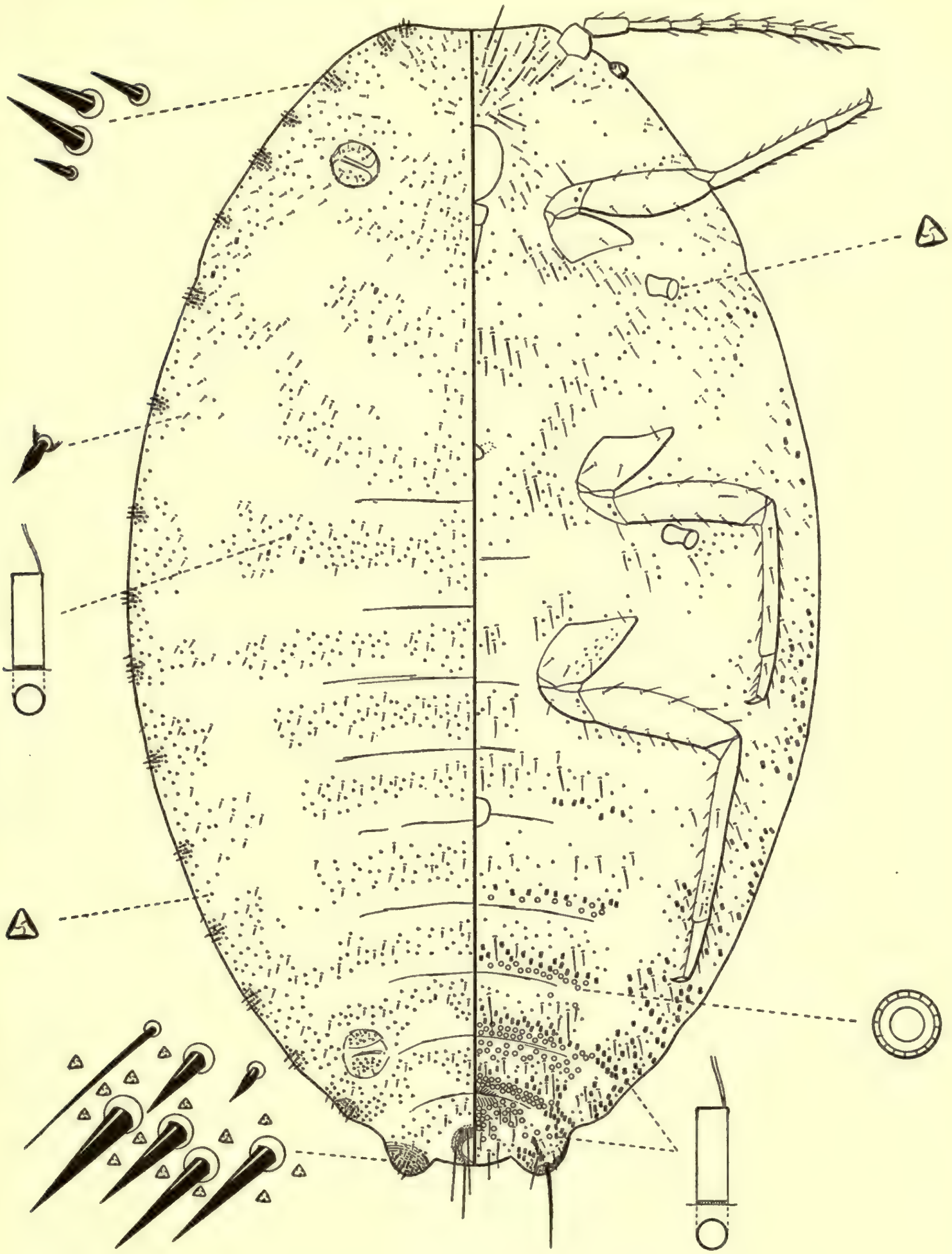

FIG. 9

Pseudococcus ugandae Laing

(Text-fig. 10)

Pseudococcus ugandae Laing, 1925, *Bull. ent. Res.* **16** : 53.

HABIT. Described from Kakumiro, Uganda on *Grevillea robusta*. Laing has given no indication of the external covering, presumably because his type material had been preserved in alcohol.

RECOGNITION CHARACTERS. Adult female broadly oval, attaining a length of 3·5 mm. Anal lobes rather small, the dorsal surface sclerotized. Antennae 9-segmented. Legs slender, claw without a denticle. Circulus moderately developed. Ostioles present, the inner edges of the lips slightly sclerotized and the lips with a few trilocular pores and rarely with setae. Anal ring with six setae which are about twice as long as the diameter of the ring. Cerarii on the five posterior segments only. Anal lobe cerarii each with a pair of conical setae surrounded by a few trilocular pores and two auxiliary setae. Anterior cerarii similar to those on anal lobes, with a few trilocular pores, but the two anteriormost cerarii are each usually composed of one seta which is smaller than the other cerarian setae. Dorsal surface with slender setae of moderate length but not numerous. Dorsal multilocular disc pores absent. Tubular ducts of three sizes. Large tubular ducts present, of the oral rim type, distributed mainly in marginal groups of two or three or even five on the posterior segments, there being also a few on the mid-region of the thorax. These large ducts are often in pairs and are thus easily noticeable. An intermediate size tubular duct with an oral rim is distributed sparsely over the dorsum mainly in irregular transverse rows. Small tubular ducts of the oral collar type are present among the intermediate type but they are not numerous. Trilocular pores sparse, evenly distributed.

Ventral surface with a pair of long stout apical setae which are longer than the anal ring setae. There is a wide sclerotized anal bar continuous with the dorsal sclerotization of each anal lobe, bearing a pair of long setae. Other ventral setae of moderate length and similar to those on the dorsum. Multilocular disc pores on all segments posterior to the circulus. On the fifth segment they occupy a double transverse row on the posterior edge. Posteriorly they are numerous in transverse rows at the anterior and posterior edges of the segments. Small tubular ducts each with an oral collar, not numerous, distributed mainly in irregular transverse rows between the multilocular disc pores on the abdomen ; anteriorly they are scattered. Trilocular pores sparse.

NOTES. This species does not belong to the genus *Pseudococcus* as now understood. It seems to have close affinities to *Phenacoccus hirsutus* Green in possessing 9-segmented antennae, only five pairs of cerarii and with numerous oral rim ducts. In *hirsutus* there are large oral rim ducts on the ventral surface which are absent in *ugandae*. Laing has stated in his original description that the antennae are 8-segmented and that there is an obscure division across the eighth segment suggesting a tendency to a 9-segmented form. In all the specimens seen the antennae are distinctly 9-segmented.

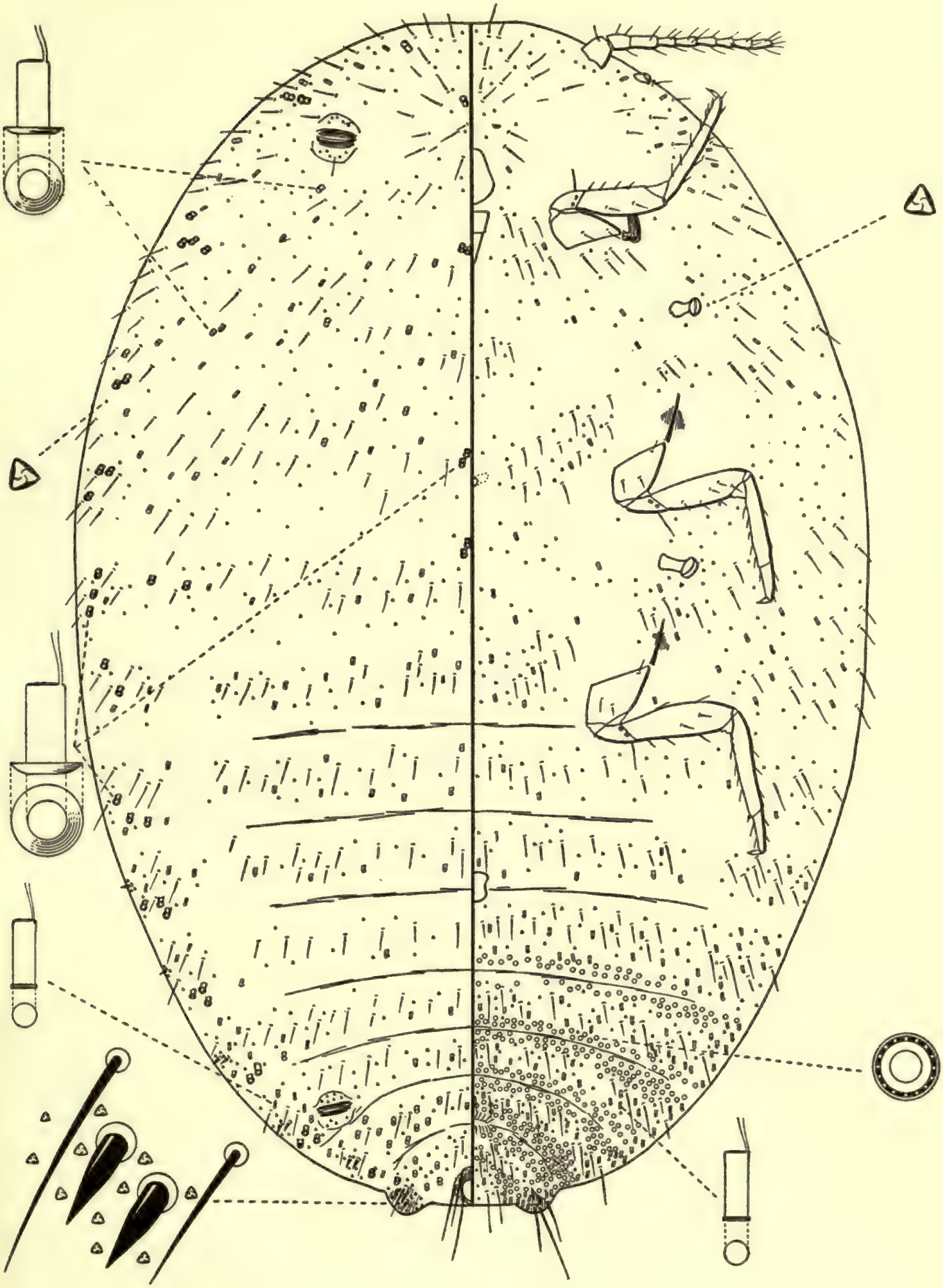

FIG. 10

THE SPECIES DESCRIBED BY A. H. STRICKLAND

Strickland collected some important scale insects in the Gold Coast during a period of research into the vectors of the virus causing " Swollen Shoot " disease of cacao. In two papers, Strickland (1947, 1947*a*) described seven new mealy-bugs, mainly from cacao. These are very interesting and give some indication of what might be expected after further intensive collecting in West Africa. Two of these species have been adequately redescribed and illustrated recently by other workers. The remaining five species are redescribed in the following pages.

Cataenococcus loranthi (Strickland)

Farinococcus loranthi Strickland, 1947, *Bull. ent. Res.* **38** : 515.
Catenococcus loranthi (Strickland), Balachowsky, 1954, *Rev. Path vég.* **33** : 247 (mis-spelling).

Strickland described this species in the genus *Farinococcus* from Tafo, Gold Coast, on *Loranthus bangwensis* attended by an undetermined ant of the genus *Crematogaster.* Ferris (1955) erected the genus *Cataenococcus* with *Dactylopius olivaceus* Cockerell as type, mainly on the basis of the 8-segmented antennae and the anal ring with six to ten setae. Balachowsky (1954) has placed *loranthi* in the genus *Cataenococcus* and given an excellent illustration from specimens collected in French Guinea on *Rhizophora racemosa.*

Delococcus tafoensis (Strickland)

Formicococcus tafoensis Strickland, 1947, *Bull. ent. Res.* **38** : 513.
Delococcus tafoensis (Strickland), Ferris, 1955, *Microentomology,* **20** : 5.

Originally described from Tafo, Eastern Province, Gold Coast on *Theobroma cacao.* It has been made the type of the genus *Delococcus* by Ferris (1955) on the basis of the 6-segmented antennae and the numerous setae on the anal ring. Ferris has also illustrated this species.

Planococcus celtis (Strickland) ***(comb. nov.)***

(Text-fig. 11)

Pseudococcus celtis Strickland, 1947, *Proc. R. ent. Soc. Lond.* (B) **16** : 154.

HABIT. Described originally from Tafo, Eastern Province, Gold Coast, on *Celtis* sp. (Urticaceae). The habit has been described by Strickland as follows : " Oval to sub-circular in shape, completely covered dorsally and ventrally with white wax, thinner along the intersegmental membranes, and ventrally, especially around the beak and coxae. With seventeen or eighteen pairs of stout lateral wax filaments, the anal pair being slightly longer than the abdominal pairs, and these longer than those anteriorly placed. No dorsal median wax-free stripe. Body colour when wax removed, a dull lemon yellow."

RECOGNITION CHARACTERS. A broadly oval species measuring approximately 2 mm. long on the slide. Antennae 8-segmented. Legs short and stout, the hind legs with some translucent pores on the coxa and tibia. Circulus present, normal for

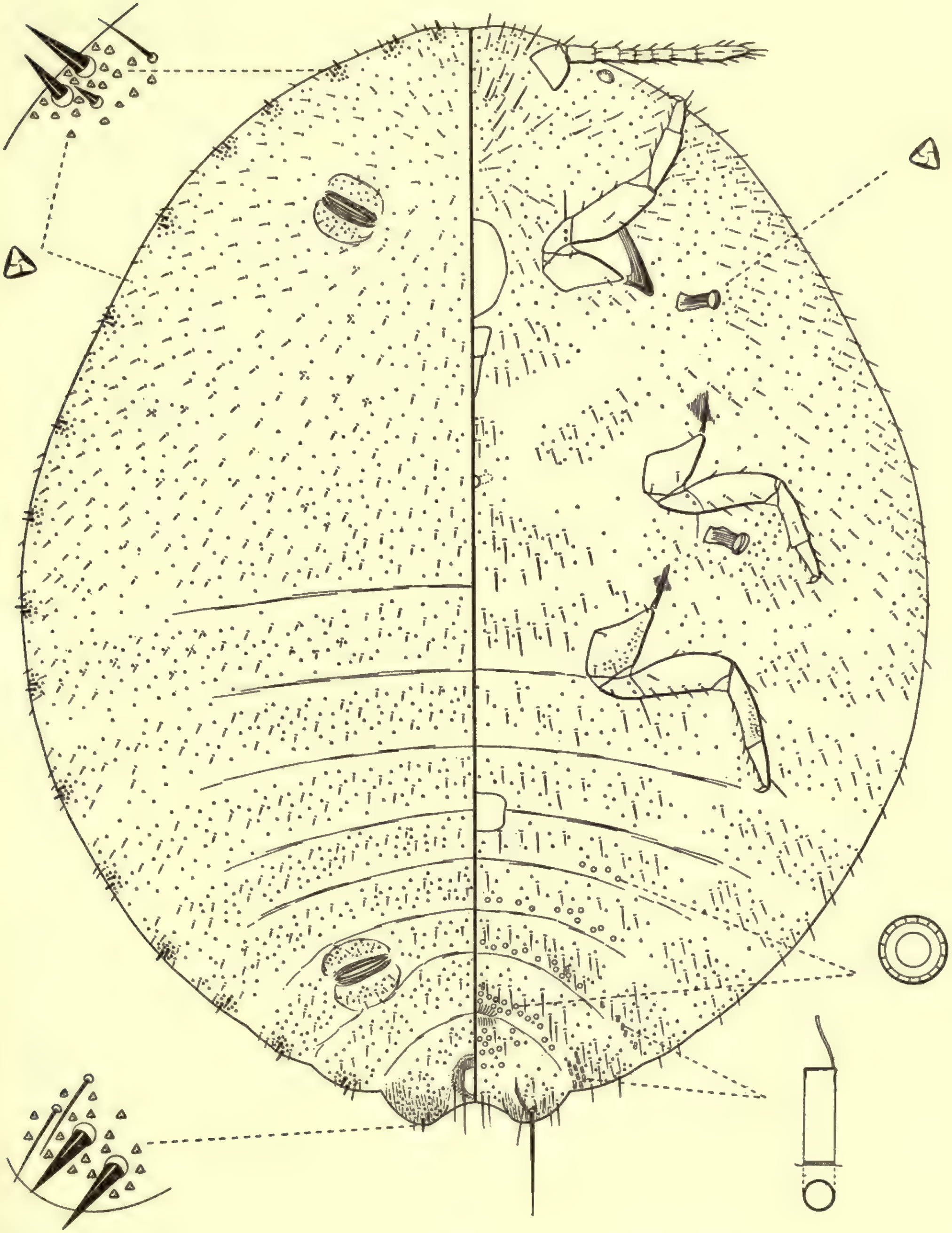

FIG. 11

the genus. Ostioles well developed with the inner edges of the lips sclerotized and with about seven setae and a few trilocular pores on each lip. Anal ring with six setae which are only slightly longer than the diameter of the ring but they are longer than the cisanal setae. Dorsal surface of anal lobes moderately sclerotized. Cerarii numbering eighteen pairs. Each cerarius composed of a pair of stout conical setae which are pointed or flagellate distally, surrounded by a group of trilocular pores and often one or two slender auxiliary setae. The third cerarius usually has one or two extra conical setae which are smaller than the main pair. Dorsal tubular ducts and multilocular disc pores absent. Trilocular pores with an even distribution ; there are often one or two trilocular pores at the bases of some of the setae on the thorax but these are not to be confused with dorsal cerarii.

Ventral surface with a pair of long apical setae which are over twice as long as the anal ring setae. Anal lobe bar reaching to the apical seta, with the bar seta as long as an anal ring seta. Ventral setae not numerous but generally longer than those on the dorsum. Multilocular disc pores confined to the abdominal segments posterior to the circulus, in single transverse rows except on the first prevulvar segment where they are in a double row. They are situated mainly in the mid-region of the segments but often reach to the margins. Approximate numbers of pores on each segment as follows : V 8, VI 22, VII 22, VIII 28, IX 20. Tubular ducts of the oral collar type mainly present in submarginal groups on the seventh and eighth segments. There is also an occasional duct in the mid-regions of these segments. Trilocular pores sparse.

NOTES. This species seems to be intermediate between two species described by De Lotto from Kenya as *P. rotundatus* and *P. subukiaensis*. It is related to the former species by the cerarii possessing auxiliary setae but differs in possessing more multilocular disc pores. The arrangement of the multilocular disc pores is similar to that of *subukiaensis* but the latter has no auxiliary setae with the cerarii.

Rhizoecus spelaea (Strickland) ***(comb. nov.)***

(Text-fig. 12)

Coccidella spelaea Strickland, 1947, *Bull. ent. Res.* **38** : 502.

HABIT. Originally described from Tafo, Gold Coast on the roots of *Theobroma cacao*. Strickland gives the following description of the external appearance : " Covered with a thin layer of finely particulate white wax, thinner along the intersegmental membranes and around the beak and coxae. With one pair of short, stout, wax filaments on the last abdominal segment."

RECOGNITION CHARACTERS. An oval species, widest on the thorax and with the abdomen tapering gradually. Length as mounted on the slide approximately 2 mm. Antennae 6-segmented, strongly geniculate, there being four stout, curved, blunt setae on the two apical segments. Legs with long slender claws and with the claw digitules reduced to small slender setae. Circuli three in number being rather large for the genus, each having a reticulated surface. The anterior circulus lying between the hind coxae and the other two circuli on the two posterior segments ; the middle

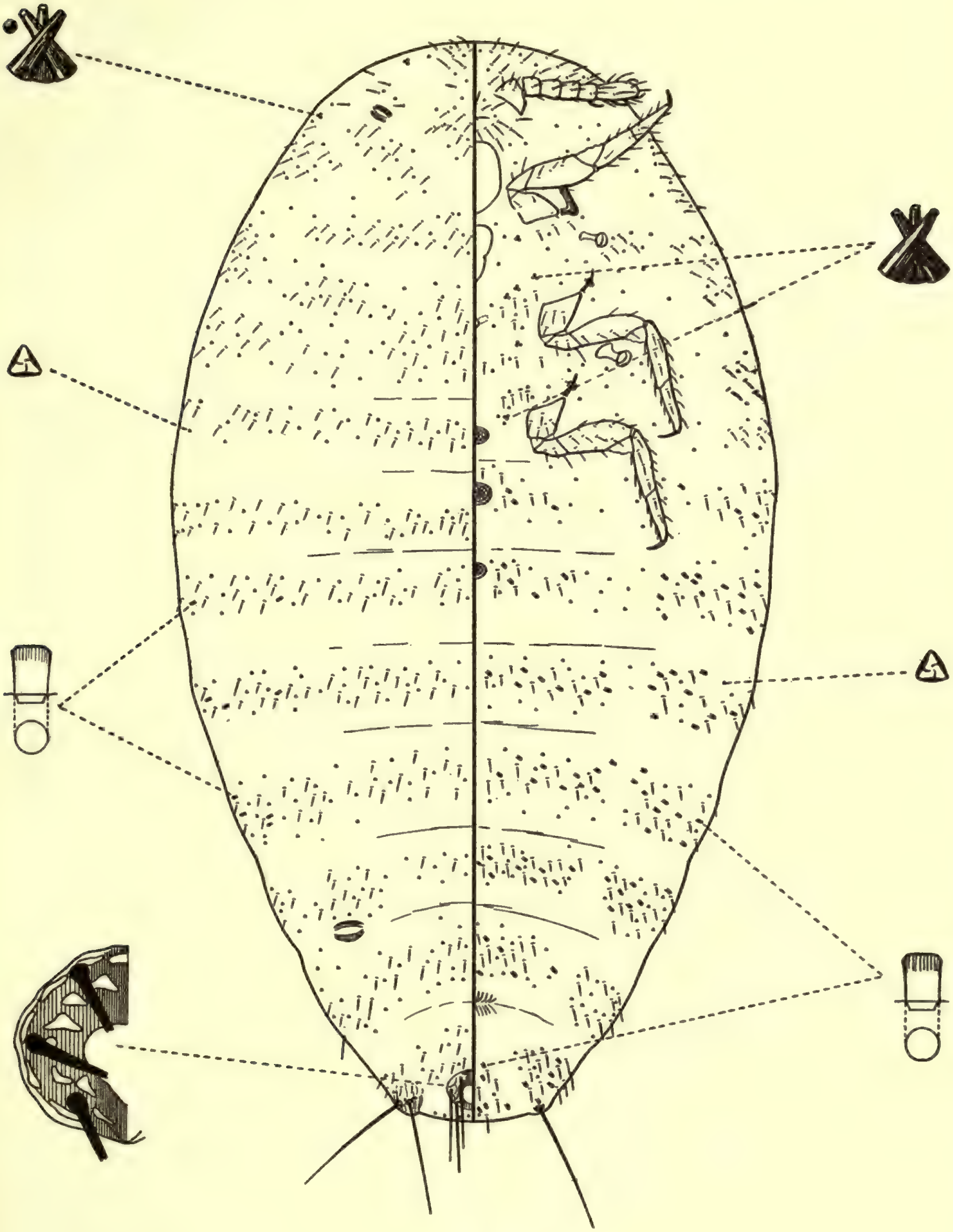

FIG. 12

circulus being the largest and the posterior circulus the smallest. Dorsal ostioles poorly developed with sclerotized lips but without setae or trilocular pores. Anal ring wide with irregular oval pores, setae about twice as long as the diameter of the ring. Eyes and cephalic plate apparently absent. Anal lobes with faint sclerotization and each with two dorsal and one ventral setae, these quite long. Dorsal surface with few setae, all short and slender. Dorsal multilocular disc pores absent. Tubular ducts often situated on the margins of the anterior abdominal segments, these rather small and their shape being somewhat difficult to determine. A few tritubular pores are present on the head margin. Trilocular pores sparse.

Ventral surface with small slender setae which are quite sparse. Multilocular disc pores absent. Tubular ducts similar to those on dorsum in transverse rows on the abdomen where they are more numerous on the anterior segments. Tritubular pores situated between the coxae, varying in number but there are usually about six pairs present. Trilocular pores sparse.

NOTES. This species was originally described in the genus *Coccidella* Hambleton but is here placed in the genus *Rhizoecus* following the redefinition of this genus by Ferris (1953). The species may be readily distinguished from the others in the genus by the three prominent circuli and by the arrangement of the characteristic tubular ducts.

Tylococcus boafoensis Strickland

(Text-fig. 13)

Tylococcus boafoensis Strickland, 1947, *Proc. R. ent. Soc. Lond.* (B) **16** : 151.

HABIT. This species was described from Tafo, Eastern Province, Gold Coast on *Musanga smithii* (Moraceae). The description of the insect in life has been given as follows : " Elongate oval in shape, covered with white wax, thinner along the intersegmental membranes and around the beak and coxae, without a dorsal wax-free stripe. With eighteen pairs of lateral wax filaments, the anal pair longer than the rest. Body colour, when wax removed, light yellow."

RECOGNITION CHARACTERS. Adult female oval measuring approximately 1·5 mm. long. Antennae 8-segmented. Legs long and slender without a denticle on the claw, hind coxae and tibiae with a few translucent pores. Circulus present, moderately developed. Anterior and posterior ostioles with the inner edges of the lips sclerotized and each lip with one or two setae and a few trilocular pores. Anal ring with six setae which are more than twice as long as the diameter of the ring. Cerarii numbering eighteen pairs, each cerarius situated at the apex of a small slightly sclerotized tubercle, except the anal lobe cerarii which are borne at the apices of larger tubercles representing the anal lobes. Each anal lobe cerarius with two stout, conical setae surrounded by a cluster of trilocular pores and usually with two auxiliary setae. The anterior cerarii similar to the anal lobe cerarii often with an auxiliary seta. Dorsal surface with a small number of slender setae many of which are very noticeable by having one to four trilocular pores at their bases and thus resembling dorsal cerarii. These setae are, however, much more slender than the cerarian setae. Dorsal multilocular disc pores and tubular ducts absent. Trilocular pores sparse.

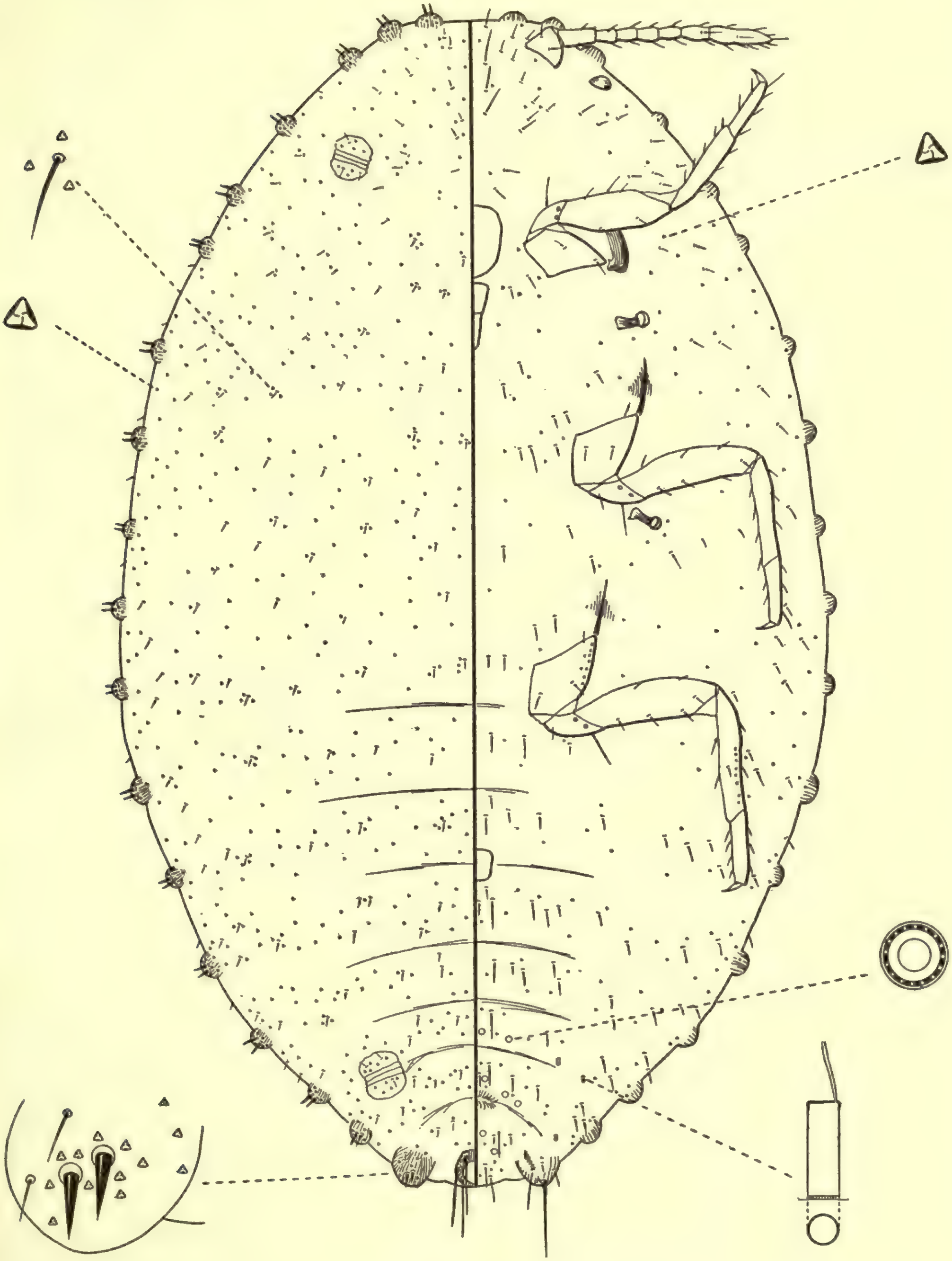

FIG. 13

Ventral surface with a small sclerotized anal lobe bar with a bar seta shorter than the anal ring setae. The apical seta is detached from the anal lobe bar and is longer than the anal ring setae. There appears to be a pair of cisanal and obanal setae which are roughly of similar shape and size but are shorter than the anal ring setae. Other ventral setae short and slender but they tend to be longer than those on the dorsal surface. Ventral multilocular disc pores very few, confined to the last three segments in single transverse rows, there being but four to six on each of the two prevulvar segments and one to three on the last segment. Ventral tubular ducts very sparse on the seventh and eighth segments only. They are situated lateral to the multilocular disc pores and there are usually four or five on the seventh segment and three or four on the eighth segment. Trilocular pores sparse.

NOTES. This species is certainly not congeneric with the type of *Tylococcus*. It seems to have a connection with the tribe Planococcini as defined by Ezzatt & McConnell (1956) by having eighteen pairs of cerarii and with the sclerotized anal lobe bars but differs from all species so far placed in that tribe by the cerarii being situated at the apices of small sclerotized tubercles. Apart from these characters the species is easily recognizable by the sparse microscopical characters such as setae and pores.

Tylococcus malacanthae Strickland

(Text-fig. 14)

Tylococcus malacanthae Strickland, 1947, *Proc. R. ent. Soc. Lond.* (B) **16** : 149.

HABIT. Described from Tafo, Eastern Province, Gold Coast on *Malacantha* sp. (Sapotaceae). Strickland gives the following description of the adult female in life : "Anterior segments lightly powdered with a fine, dusty, yellow wax, the posterior segments nude of wax. With eighteen pairs of groups of thin, glossy, yellow wax filaments laterally, each group consisting of two or three individual filaments issuing from a cerarius. Body colour, when wax removed, ochreous yellow."

RECOGNITION CHARACTERS. A broadly oval species, the largest measuring approximately 2·5 mm. long × 1·5 mm. wide. Antennae 8-segmented. Legs short and stout. Circulus large, dumb-bell shaped. Ostioles well developed, the lips heavily sclerotized and bearing an occasional seta but apparently without trilocular pores. Anal ring set at a distance of about one and a half times its diameter from the apex of the body ; with six setae which are only slightly longer than the diameter of the ring. The ring is surrounded by a sclerotized band containing a few short setae and trilocular pores belonging to the ninth segment. Cerarii numbering eighteen pairs, each borne at the apex of a sclerotized tubercle of variable size. Anal lobe cerarius consisting of three prominent and slightly lanceolate setae at the apex of a large tubercle representing the anal lobe. The anal lobe tubercle is the largest and bears about three auxiliary setae and one or two trilocular pores. The penultimate and antepenultimate cerarii each bear four cerarian setae at the apex of a tubercle. Anteriorly the cerarii are each composed of two large setae except the ocular cerarius which usually contains but one seta. The tubercles become smaller anteriorly but the frontal cerarius is often large and lies on the ventral

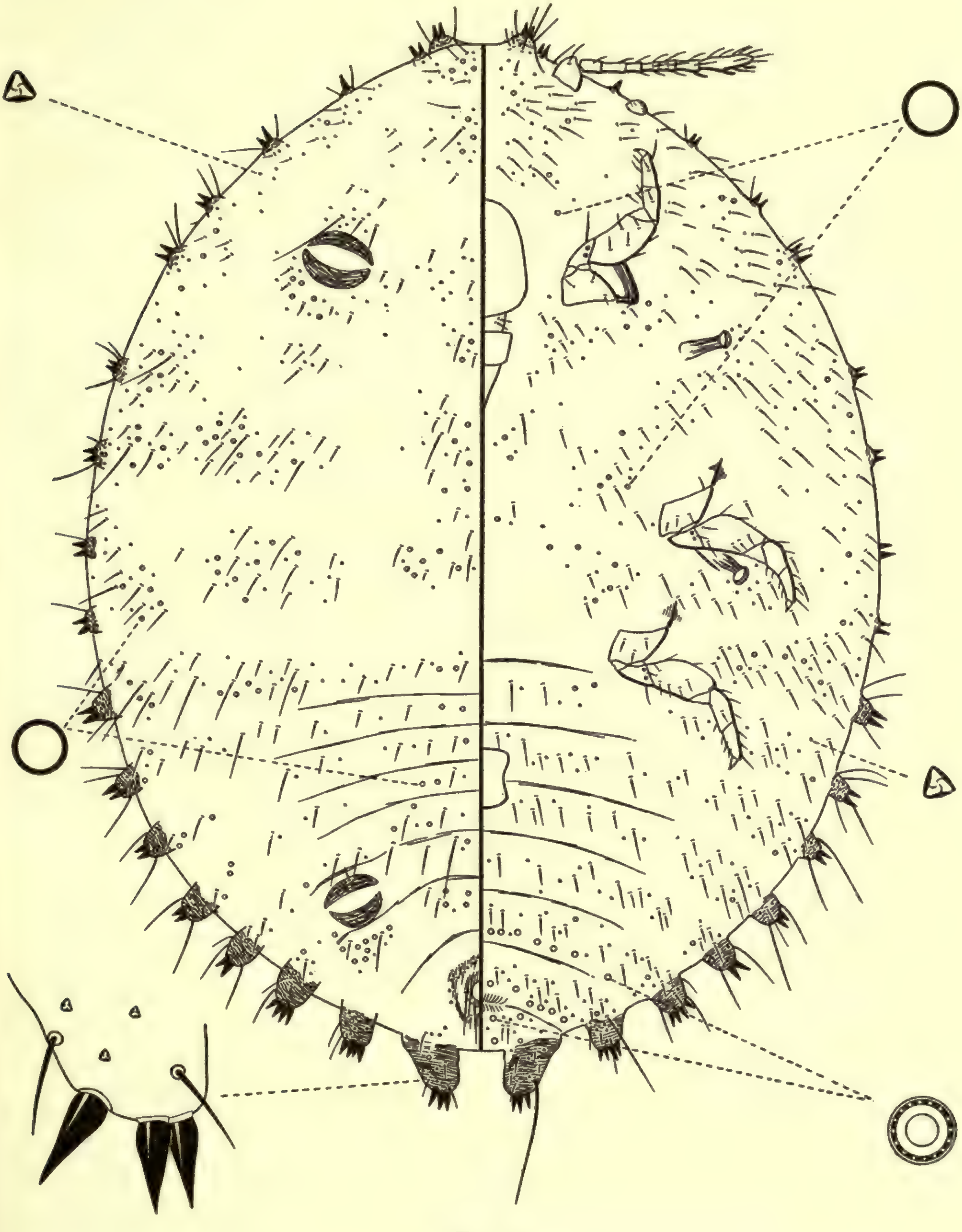

FIG. 14

surface. Each tubercle bears from one to five extremely long setae and one or two trilocular pores ; occasionally there is also a circular disc pore either on the dorsal or ventral side. Dorsal setae not numerous, of various sizes, but all slender. Some of these setae are very long and become flagellate distally ; on the anterior part of the body they form groups as illustrated. Dorsal multilocular disc pores and tubular ducts absent. Circular disc pores, larger than the trilocular pores are distributed over the surface and they lie in definite groups on the anterior half of the body associated with the groups of setae. Posteriorly there are a few in the mid-region of each segment and a few laterally. Trilocular pores sparse, associated with the groups of setae.

Ventral surface with a pair of long, apical setae. As the anal lobe tubercles are heavily sclerotized it is possible that there is an anal lobe bar which is masked ; an examination of young adult females would possibly show if this is correct. Ventral setae of various sizes but all slender, not numerous. Multilocular disc pores confined to the last three segments, there being eleven to seventeen on the seventh segment, nine to thirteen on the eighth segment and five to eight between the anal lobes. On the two prevulvar segments they occupy single transverse rows and altogether there are scarcely more than thirty-five present. Circular disc pores similar to those on the dorsum, sparsely scattered. There is usually one on the margin of each abdominal segment and others in marginal groups anteriorly and between the coxae. Ventral tubular ducts absent. Trilocular pores sparse.

NOTES. Although this species has close affinities to the genus *Tylococcus* it is not certain whether it is congeneric. It differs from *T. madagascariensis* Newstead, the type of genus, in possessing numerous circular disc pores on the dorsal surface and very long setae with flagellate ends. These characters are shared with *T. westwoodi* Strickland, a discussion of which follows but the species differs from *westwoodi* in possessing eighteen pairs of cerarii instead of eleven or twelve.

Tylococcus westwoodi Strickland

(Text-fig. 15)

Tylococcus westwoodi Strickland, 1947, *Bull. ent. Res.* **38** : 510.

HABIT. Described from Atikpale, Eastern Province, Gold Coast on *Theobroma cacao* attended by an undetermined ant of the genus *Crematogaster*. Strickland gave the following account of the adult female : " Body colour apparently dark red, but material preserved two days in alcohol before examination, so no field description is possible. Specimens with a few strands of a dark red wax still adhering to the dorsum."

RECOGNITION CHARACTERS. Adult female broadly oval measuring approximately 1·5 mm. long. Antennae 8-segmented. Legs short and stout with a few translucent pores on the hind coxa and tibia. Circulus present. Ostioles well developed, with the inner edges of the lips heavily sclerotized and each lip with two or three long setae and three or four trilocular pores. Anal ring lying about one and a half times its diameter from the apex of the abdomen, with six setae which are only a little longer than the diameter of the ring. Cerarii numbering eleven or twelve pairs.

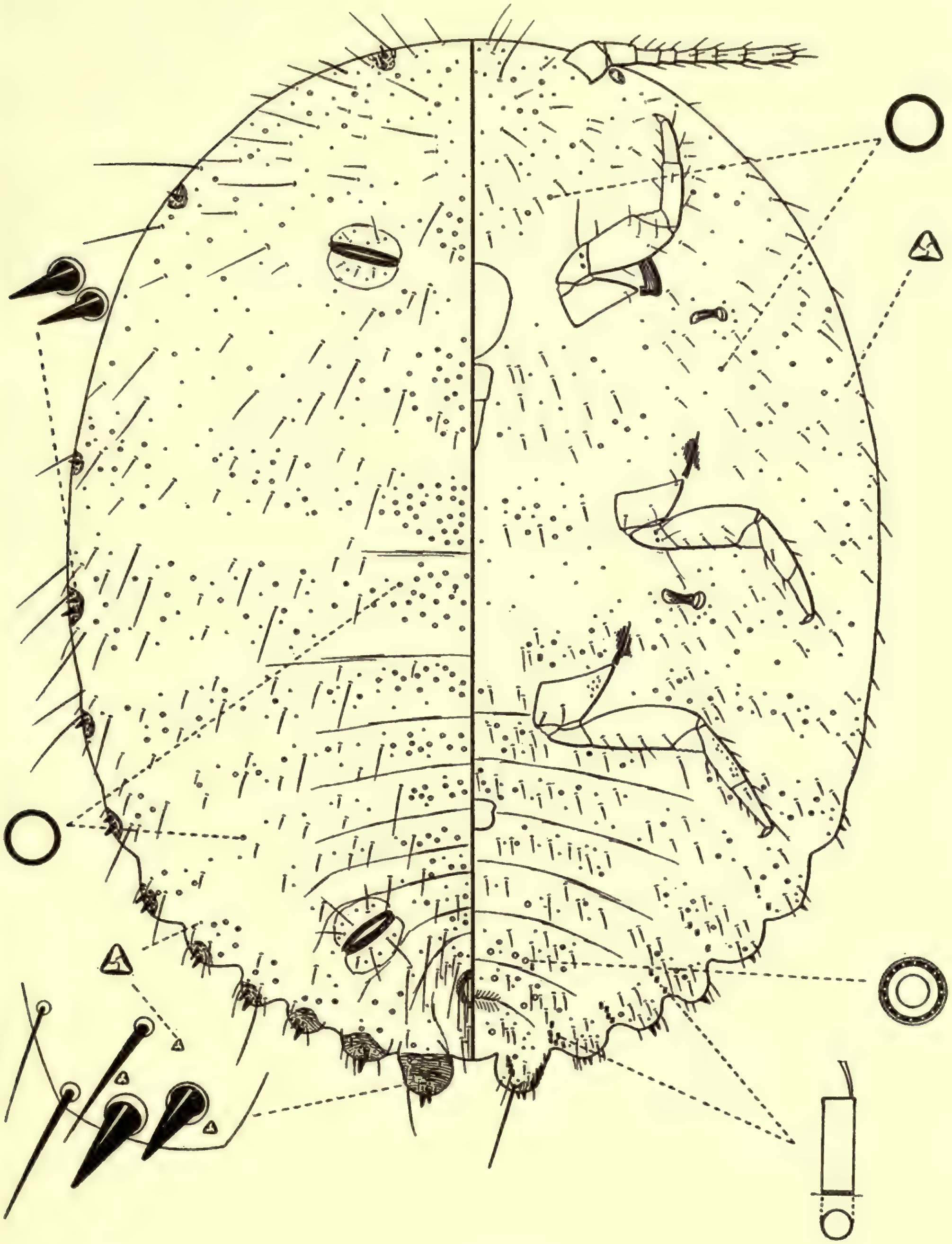

FIG. 15

Anal lobe cerarii each composed of two stout conical setae which are blunt at the apices, surrounded by about three trilocular pores and two long, stout, auxiliary setae. The anal lobes form prominent sclerotized tubercles. Anteriorly there is a pair of cerarii to each abdominal segment and the other cerarii are located on the thorax and head. Most of these cerarii are composed of two conical setae often of unequal size but some of the anterior cerarii may have only one seta. The posterior cerarii are borne at the apices of poorly developed tubercles and the anterior cerarii are each surrounded by a circular sclerotized area bearing an occasional trilocular pore and one or two auxiliary setae, these often extremely long. Dorsal setae of various lengths, mainly slender. Many of these setae are extremely long with the distal end flagellate, present on the margins and irregularly over the surface especially on the head and thorax. Dorsal multilocular disc pores and tubular ducts absent. Circular disc pores numerous in mid-regional groups on each segment. They become scattered laterally. Trilocular pores sparse.

Ventral surface with the anal lobes sclerotized on the margins and with a small sclerotized anal lobe bar and a bar seta which is of similar length to the anal ring setae. Apical seta detached from the anal bar, nearly twice as long as anal ring setae. Ventral setae of various sizes mainly short and slender but there are a few long setae around the margins similar to those on the dorsal surface. Multilocular disc pores confined to the four posterior segments. On the sixth segment there are usually one or two, on the seventh and eighth segments there are single transverse rows of about six pores and on the last segment there are one or two pores. Altogether there are scarcely more than twenty pores present. Tubular ducts distributed mainly in marginal groups on the fourth to eighth abdominal segments but others may be present on the mid-region of the abdominal segments. Circular disc pores not so numerous as on dorsum ; they are rather scattered and do not form definite groups. Trilocular pores not numerous.

NOTES. All the species seen appear to be young adults and it may be that the marginal tubercles bearing the cerarii at the apices become more developed in the older specimens. This species seems to be congeneric with *T. malacanthae* Strickland, already discussed, in possessing numerous dorsal circular disc pores and extremely long setae with the distal ends flagellate.

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xnf.

Pp. 39–76 ; 65 *Text-figures*

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THE AFRICAN SPECIES OF *STIVALIUS*, A GENUS OF SIPHONAPTERA

By F. G. A. M. SMIT

THE seven species of the large genus *Stivalius* (Family Pygiopsyllidae) which were hitherto known to occur in Africa[1] are redescribed and figured in the present paper, while six new species of *Stivalius* from Africa are described and also the hitherto unknown male of *S. sellatus* ; a key is provided for the identification of these thirteen species.

The specimens examined are in the Rothschild and British Museum collection of fleas at Tring, unless stated otherwise.

The thirteen African species of *Stivalius* belong to two groups which can be distinguished as follows :

(*a*) Genal margin below the eye divided into two partly overlapping small lobes (Text-fig. 1) ; ♂—movable process of clasper without a dense group of thin setae on inner side (Text-fig. 5) ; tendons of phallosome very short, not or hardly reaching beyond the apex of the aedeagal apodeme (Text-fig. 16) ; dorsal margin of aedeagal apodeme nearly straight, not deeply concave preapically (Text-fig. 16) ; ♀—no paired sclerotic structure alongside the bursa copulatrix (Text-fig. 25) ; dilated part of ductus spermathecae slender, with a number of thick sclerotic internal rings, giving this part of the duct a strong resemblance to a tape-worm (Text-fig. 25)[2] ; bulga of spermatheca with a thin wall and internal striae (Text-fig. 25) *ferinus*-group, p. 42

(*b*) Genal margin below the eye entire (Text-fig. 2) ; ♂—movable process of clasper with a dense group of straight and thin setae on inner side and bordering the ventral margin (Text-figs. 8–15) ; tendons of phallosome making at least half a convolution (Text-fig. 17) and often much more (Text-fig. 18) ; apical half of dorsal margin of aedeagal apodeme strongly concave (Text-figs. 17, 18) ; ♀—bursa copulatrix in most species with a dark sclerotic structure on each side (Text-figs. 26, 28–37) ; the dilated part of the ductus spermathecae with a large number of very thin internal rings (Text-figs. 26, 28–37) ; bulga of spermatheca with a thick wall and without internal striae (Text-figs. 26, 28–37) . . . . *torvus*-group, p. 47

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[1] Jordan & Rothschild (1922, *Ectoparasites*, **1** : 252, 254) recorded *Stivalius ahalae* and *S. aporus* from Mfongosi, Zululand ; these two rat-parasites do not belong to the African fauna, but to that of India and Burma. In all probability this record was due to some error, perhaps mislabelling.

[2] The ductus spermathecae is similarly ringed in females belonging to the following groups of *Stivalius* : *robinsoni*-group (squirrel-parasites : *S. robinsoni* (Rothschild) (Malaya, Sumatra), *S. javanus* Jordan (Java), *S. rhaebus* Jordan (Borneo) and *S. lonchus* Jordan (Borneo)) ; *ahalae*-group (rat-parasites : *S. ahalae* (Rothschild) (India), *S. aporus* Jordan & Rothschild (India, Ceylon), *S. phoberus* Jordan & Rothschild (Ceylon) and *S. cognatus* Jordan & Rothschild (Java)) ; *jacobsoni*-group (rat-parasites : *S. jacobsoni* (Jordan & Rothschild) (Java, Sumatra) and *S. klossi* (Jordan & Rothschild) (Annam, Thailand, Malaya, Sumatra, Java)) ; squirrel and *Tupaia* parasite *S. mjöbergi* Jordan (Borneo).

FERINUS-GROUP

The new species described below is the only known representative of the *ferinus*-group in Africa. Of the other three species, belonging to this group, two occur in the Oriental Region (Ceylon, India, Malaya) and one in Japan.

Stivalius alienus sp. n.

(Text-figs. 1, 3, 5–7, 16, 25)

TYPE MATERIAL. Male holotype, female allotype and 8 male paratypes from Calonne plantation, nr. Elisabethville, Belgian Congo, from a nest (probably of a gerbil), 9.vi.1953; 1 female paratype from the same locality, from *Rattus* (*Mastomys*) *natalensis*, vi.1953; 2 female paratypes, nr. Elisabethville, from *Rattus* (*Mastomys*) *natalensis*, viii.1953; all collected by Dr. R. Devignat, to whom one pair of paratypes has been returned; 1 male paratype from the neighbourhood of Elisabethville, from *Crocidura pilosa*, 1957; 1 female paratype, same locality, from *Mus triton*, 1957; 1 female paratype, same locality, from *Pelomys fallax*, 1957—these three specimens were collected by P. L. Pirlot and the male and one female are in the Musée Royal du Congo Belge, Tervuren; 1 male paratype from the Suji Valley, 6,000 ft., S. Pare Mts., Tanganyika, i.1957, from *Arvicanthis* sp., collected by J. G. Halcrow.

DIAGNOSIS. A member of the *ferinus*-group, which includes *S. ferinus* (Rothschild) (a shrew-parasite from Ceylon and India), *S. insolli* Traub (a bird-parasite from Malaya) and *S. aestivalis* Jameson & Sakaguti (a wood-mouse (*Apodemus*) parasite from Japan). The new species differs from *S. ferinus* by the unmodified (not subspiniform) setae in the submarginal frontal row, from *S. insolli* and *S. aestivalis* by the absence of a row of short setae preceding the main row of setae on the pronotum, while in *S. insolli* the number of pronotal spines is about 30 as against 20 in *S. alienus*. There are also differences in the genitalia between these species.

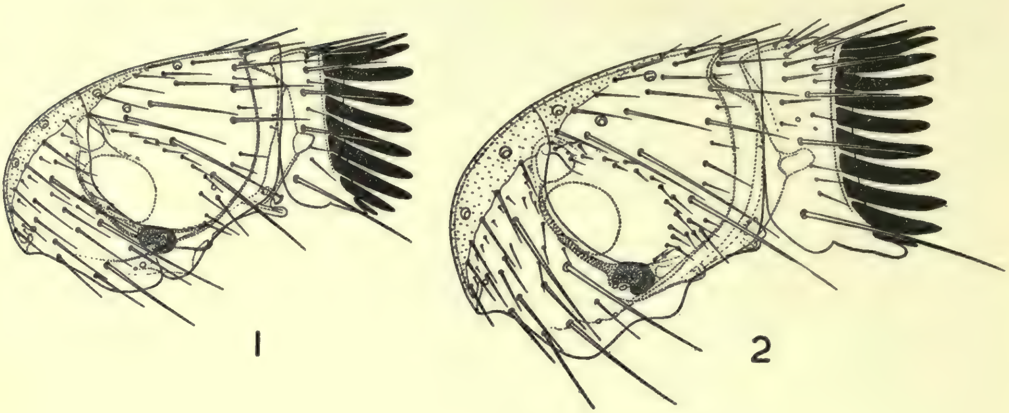
DESCRIPTION. HEAD (Text-fig. 1). Frontoclypeal margin smoothly rounded. Preoral tuber short. Submarginal frontal row consisting of six setae in both sexes; between this row and the eye there are about a dozen large and fairly large setae and numerous minute setae on the preantennal region of the head, the minute ones absent on the gena. Genal margin below the eye divided into two short lobes the anterior of which partly overlaps the posterior. Frontal area of micropores relatively narrow. Eye well developed, kidney-shaped. Maxillary palps not quite reaching to the middle of the anterior margin of the fore coxa; the first segment longer than the second, while the third segment is the shortest of the four. The laciniae are smooth basally and extremely finely serrated apically. The labial palp, reaching to about two-thirds the length of the fore coxa, consists of five segments. Scapus of antenna on the outer side of its widened portion with five to six thin setae in the male and three to four in the female; pedicellus in both sexes with six slender setae, several of which reach to or a little beyond the first segment of the clava; the clava consists of the usual nine segments (excluding the petiolus). Postantennal region of head with three rows of setae (the displaced seta between the first and second row in

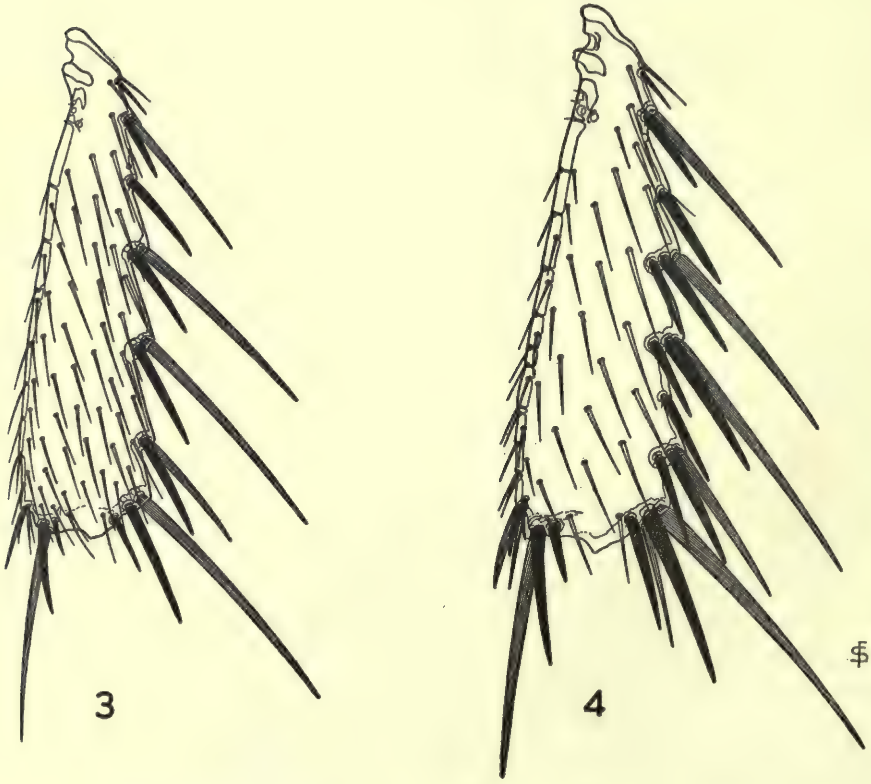
Text-fig. 1 is an abnormality) and a large seta about mid-way between the lowest seta of the second and third row ; the first row consists of five setae each side in the male and six in the female, while the second row normally has six setae each side in both sexes as has also the third row. Bordering the antennal fossa posteriorly are about 11–14 small setae in both sexes.

THORAX. Pronotum (Text-fig. 1) narrow, with one row of six setae each side and a ctenidium of 20 slightly curved spines which are longer than the pronotum. Mesonotum with a main row of five setae each side, preceded by two rows of more numerous small and irregularly placed setae ; two fairly long pseudosetae dorsally under the collar of the mesonotum. Mesepisternum with three to four setae, of which one or two are usually small ; mesepimeron normally with six (sometimes seven) setae. Metanotum with three rows of setae ; the first row consists of two to three setae in the male, four to six in the female, the second and third rows in both sexes with seven to ten and six setae respectively (the lowest seta of the main row much smaller than the others in the row) ; in the female the first metanotal row is preceded by one or two small dorsal setae. Pleural arch well-developed. Metepisternum with one large and one or two minute setae ; metasternum dorso-posteriorly with one large seta ; metepimeron with one to three small and eight to nine large setae in the male, three to four small and nine to eleven large setae in the female.

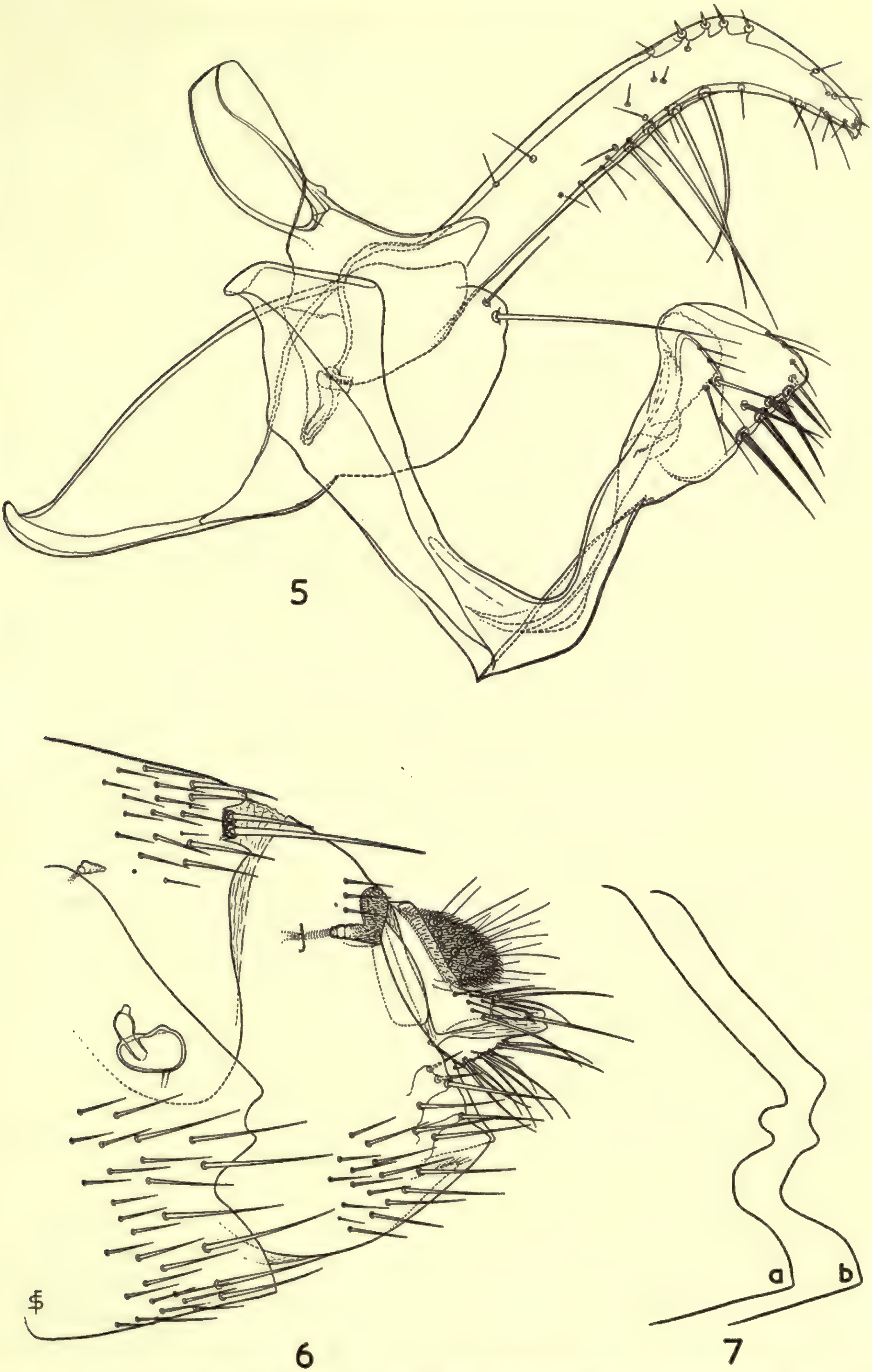
LEGS. Fore coxa with numerous setae all over the outer side ; mid coxa with setae along the lower half of the anterior margin, a patch of setae on the outer side of the ventro-anterior part and two (sometimes three) ventro-posterior setae ; the oblique suture of the outer surface of the mid coxa is uninterrupted ; chaetotaxy of hind coxa similar to that of mid coxa, but in addition there is a small group of short setae ventro-anteriorly on the inner side. Fore femur, apart from marginal setae, with 12–16 lateral setae on the outer side and only one very small seta on the basal part of the inner side. Mid and hind femora with the usual marginal and submarginal setae, but without lateral setae. All tibiae with seven notches in the posterior (dorsal) margin, the most dorsal one bearing only two smallish setae ; chaetotaxy of the hind tibia as shown in Text-fig. 3. Fifth segment of all tarsi with six pairs of lateral plantar setae, arranged as is usual in the genus, namely the first and third pairs shifted on to the plantar surface in the fore and mid tarsus, while in the hind tarsus only the third pair is shifted on to the planta ; in the male the last segment of fore and mid tarsi has four short and stout subapical plantar setae. The two preapical lateral setae are short on the fifth segment of all tarsi, reaching to about the middle of the claws.

ABDOMEN. Tergum I with three distinct rows of setae and a few dorsal setae in front of the first row ; terga II–VII with two distinct rows of setae and in addition several dorsal setae in front of the first row and these may form an irregular short row. The numbers of setae in the main row on each side of terga I–VII are in the male : 4, 7, 7, 7, 7, 7, 7 respectively ; in the female : 4, 7, 8, 8, 8, 7, 4 (or 5). Terga II–V in both sexes each with one marginal spinelet on each side near the dorsum. Both sexes with two antesensilial setae, the lower of which is more than twice the length of the upper ; in the female (Text-fig. 6) the margin of tergum VII between





Figs. 1, 2. Head and pronotum of: 1. *Stivalius alienus* sp. n. (female paratype, plantation Calonne). 2. *S. torvus* (Rotschild) (female, Kisii, Kenya). Figs. 3, 4. Hind tibia of: 3. *S. alienus* sp. n. (female allotype). 4. *S. torvus* (Rothschild) (female, Keruguya, Kenya).



FIGS. 5–7. *Stivalius alienus* sp. n. 5. Clasper and sternum IX (holotype). 6. Terminalia (allotype). 7. Outline of sternum VII of female (*a*—paratype, nr. Elisabethville, *b*—paratype, plantation Calonne).

the two sets of antesensilials is produced into a short triangular lobe ; below the antesensilials the margin forms in the female an angulate lobe and below this the margin is slightly concave for a considerable distance. Basal abdominal sternum with a lateral patch of two to four setae in the male and 13–17 in the female, and with two setae each side along the ventral margin of which one is placed in front of the other. Sterna III–VII in the male normally with three setae each side in the main row, in the female the main row of sterna III–VI consists of four setae ; in both sexes these main rows are preceded by a patch of numerous smaller setae.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. MALE (Text-figs. 5, 16). Tergum VIII with 0–3 setae each side anterior to the vertical part of the spiracular fossa. Sternum VIII with about 30–35 setae each side. Apodeme of tergum IX narrow, ventrally not solidly fused with the dorso-caudal part of the manubrium, the latter basally very broad and tapering gradually to an upturned tip (Text-fig. 5). Fixed process of clasper with two (one short, one long) acetabular setae. Movable process (Text-fig. 5) of a shape characteristic for the majority of the representatives of the genus, with relatively few setae along the ventral (posterior) margin and a group of three large setae and one smaller one placed along this margin just before the bend. Proximal arm of sternum IX (Text-fig. 5) fairly broad ; the distal arm of this sternum narrow in its basal half whence it widens gradually, its dorso-apical portion smoothly rounded ; four or five of the setae along the apical part of the ventral margin much stouter than the other setae of the apical portion. Phallosome as in Text-fig. 16 ; note the very short tendons of the phallosome, the straight and simple inner tube, the dorso-apical aedeagal sclerite with two sharp apical projections, and the long and narrow caudally curved and membranous lobe of the ventral lateral wall.

FEMALE (Text-figs. 6, 7, 25). Posterior margin of sternum VII (Text-figs. 6, 7) with a double sinus, the upper bay of which is much smaller than the lower ; the main row consists of five strong setae and is divided by a gap between two dorsal setae and three ventral ones. In front of this row are numerous smaller setae. Variation in the outline of the posterior margin of sternum VII as shown in Text-figs. 6, 7. Tergum VIII with three to six setae in front of the widened vertical part of the spiracular fossa ; chaetotaxy of the ventral part of tergum VIII as in Text-fig. 6. Sternum VIII apically narrow and with several minute setae at and near the apex. Anal segment as in Text-fig. 6 ; anal stylet about thrice as long as its maximum width, with one long apical seta and two minute preapical ones. Bulga of spermatheca (Text-figs. 6, 25) longer than wide, with a dorsal hump ; the hilla protrudes deeply into the lumen of the bulga and bears apically a papilla. Ductus bursae curved, bursa copulatrix with a longish posterior internal sclerotization. The basal half of the ductus spermathecae is internally reinforced by numerous sclerotic rings (Text-fig. 25).

LENGTH. ♂ 2½–2¾ mm., ♀ 3–3½ mm.

REMARKS. Even without the host records it would have been possible to deduce *Stivalius alienus* to be probably a parasite of rodents. The species of the *ferinus*-group provide an excellent example of the modifications of the pronotal ctenidium which arise in response to the nature of host-relationships. In *S. alienus* (Text- fig. 1) and in *S. aestivalis* (Text-fig. 63) (a flea of *Apodemus*) the pronotal ctenidium consists of fairly straight spines—this is the usual type of ctenidium in a large number of rodent-fleas. In *S. ferinus* (Text-fig. 64), a parasite of shrews, the spines of the pronotal ctenidium are blunt and distinctly curved and are longer than the pronotum —this is characteristic of a number of shrew-fleas. In *S. insolli* (Text-fig. 65), a bird-parasite, the number of pronotal spines has increased considerably—about 30 as against 18–20 in the three mammal parasites of this group ; fleas of the super-family Ceratophylloidea which have become parasites of birds always have a larger number of pronotal spines (usually more than 24) than related forms living on mammals.

TORVUS-GROUP

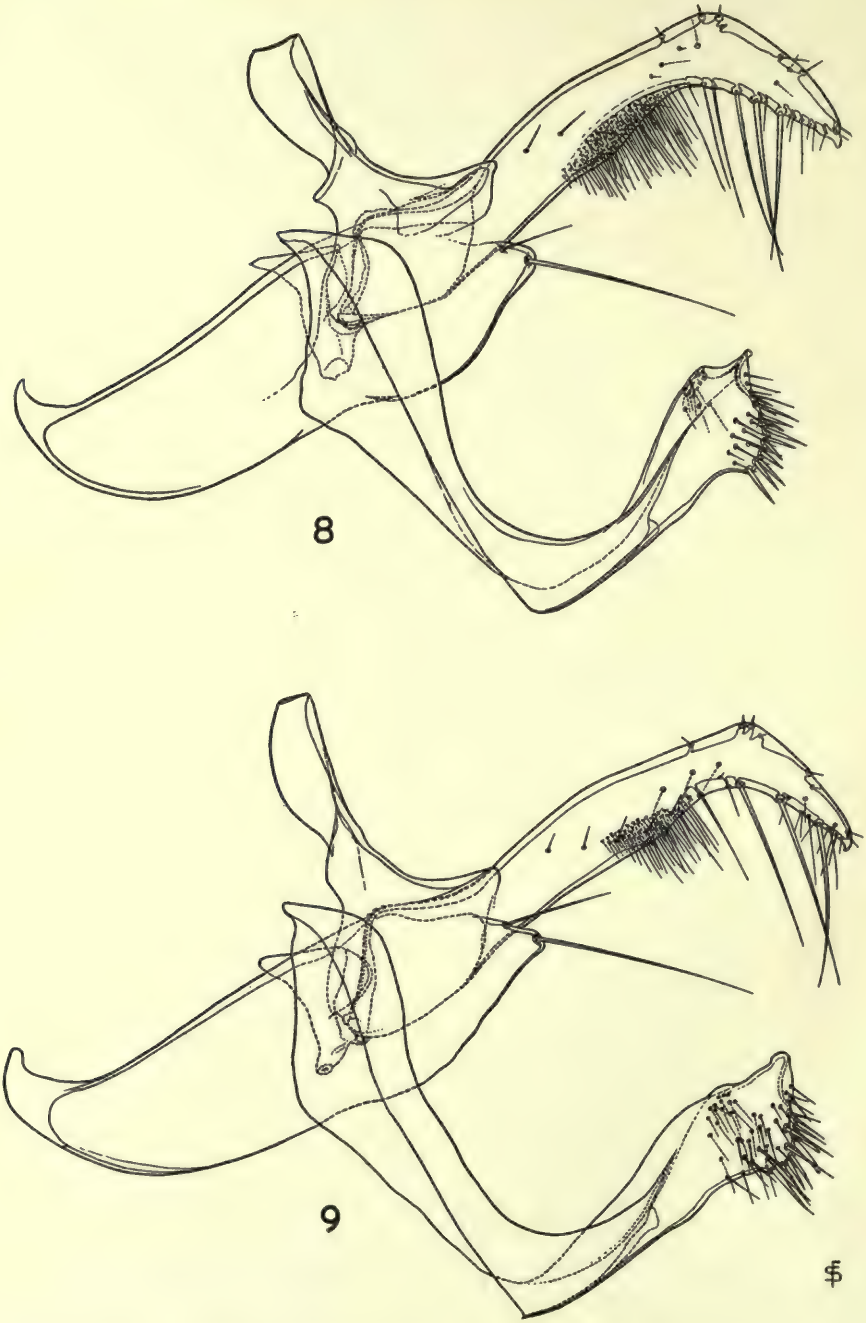
The members of this group, which is confined to Africa, are rather uniform in the structure of the head, thorax, legs and unmodified abdominal segments ; the main differences between the species are in the genitalia. *Stivalius torvus*, by far the commonest and most widespread member of the group, is described in detail, and the other species are described in comparison with this species.

Stivalius torvus (Rothschild), 1908

(Text-figs. 2, 4, 8, 17, 26, 28, 38, 39, 53, 54)

Pygiopsylla torvus Rothschild, 1908, *Ent. mon. Mag.* **44** : 77.
Pygiopsylla " *afer* " Jordan & Rothschild, 1913, *Novit. zool.* **20** : 537 (err. det., 1 ♀ from Kagamba, Uganda ; see Jordan & Rothschild, 1922, *Ectoparasites*, **1** : 252).
Stivalius " *afer* " Symes & Hopkins, 1932, *Rec. Med. Res. Lab. Nairobi* (**1**) : 18, 19, 40, 44, 56.
Stivalius torvus Jordan & Rothschild, 1922, *Ectoparasites*, **1** : 251, 264, fig. 241 ; Dalla Torre, 1924, *Ber. naturw. med. Ver. Innsbruck*, **39** : 11 ; Jordan, 1936, *Novit. zool.* **39** : 297, figs. 54–56 ; Jordan, 1937, *Novit. zool.* **40** : 290 ; Hopkins, 1947, *Uganda J.* **11** (Suppl.) : 155 ; Jordan, 1948, in Smart, *Insects of medical importance* (London) : 240 ; Hopkins, 1949, *Rep. rats, fleas, plague, Uganda:* 9, tables 2, 6, 10, 12, 20.

MATERIAL EXAMINED. TANGANYIKA : Tengeru, *Rattus* (*Mastomys*) *natalensis*, 26.ii.1952, 1 ♂, 1 ♀. KENYA : Keruguya, *Rattus* (*Mastomys*) *natalensis*, *Lophuromys flavopunctatus aquilus*, *Lemniscomys* sp., *Otomys* sp., 1935–36, 10 ♂ 8 ♀ ; without locality and host, 1927, 1 ♀, and 1913, 1 ♂, 3 ♀ ; Machakos, house-rat, 23.v.1927, 2 ♀ (Jordan, 1936 : 297) ; Kisii, house-rat, 23.v.1927, 1 ♀. UGANDA : Mubuku valley, E. side of Ruwenzori, 6,000 ft. *Grammomys dryas*, 1.iii.1906, the male holotype (Rothschild, 1908 : 77 ; Jordan & Rothschild, 1922 : 252) ; Kanungu, Kigezi, *Lophuromys flavopunctatus aquilus*, 2.x.1940, 1 ♀ ; same locality, *Arvicanthis abyssinicus*, x.1940, 1 ♀ ; Kagamba, Kazara county, Ankole, *Dasymys incomtus medius*, 14.vii.1911, 1 ♀ (Jordan & Rothschild, 1913 : 537, as " *afer* "; 1922 : 252) ; Damba Island, Lake Victoria, young rodent in nest, xi.1911, 1 ♀. BELGIAN CONGO (specimens in the Musée Royal du Congo Belge, Tervuren, are marked with (MCB)) : Irumu district, Ituri, *Arvicanthis abyssinicus*, 15.viii.1946, 3 ♀ (MCB) ; Kunga, Mt. Wago, Ituri, nest of *Oenomys hypoxanthus*, 23.vii.1946, 1 ♀ (MCB) ; Pikanza, Ituri, *Rattus* (*Mastomys*) *natalensis ugandae*, 14.v.1946, 1 ♂ (MCB) ; Blukwa, Ituri, *Rattus* (*Mastomys*) *natalensis ugandae*, 13.xii.1945, 1 ♀ (MCB) ; Blukwa,

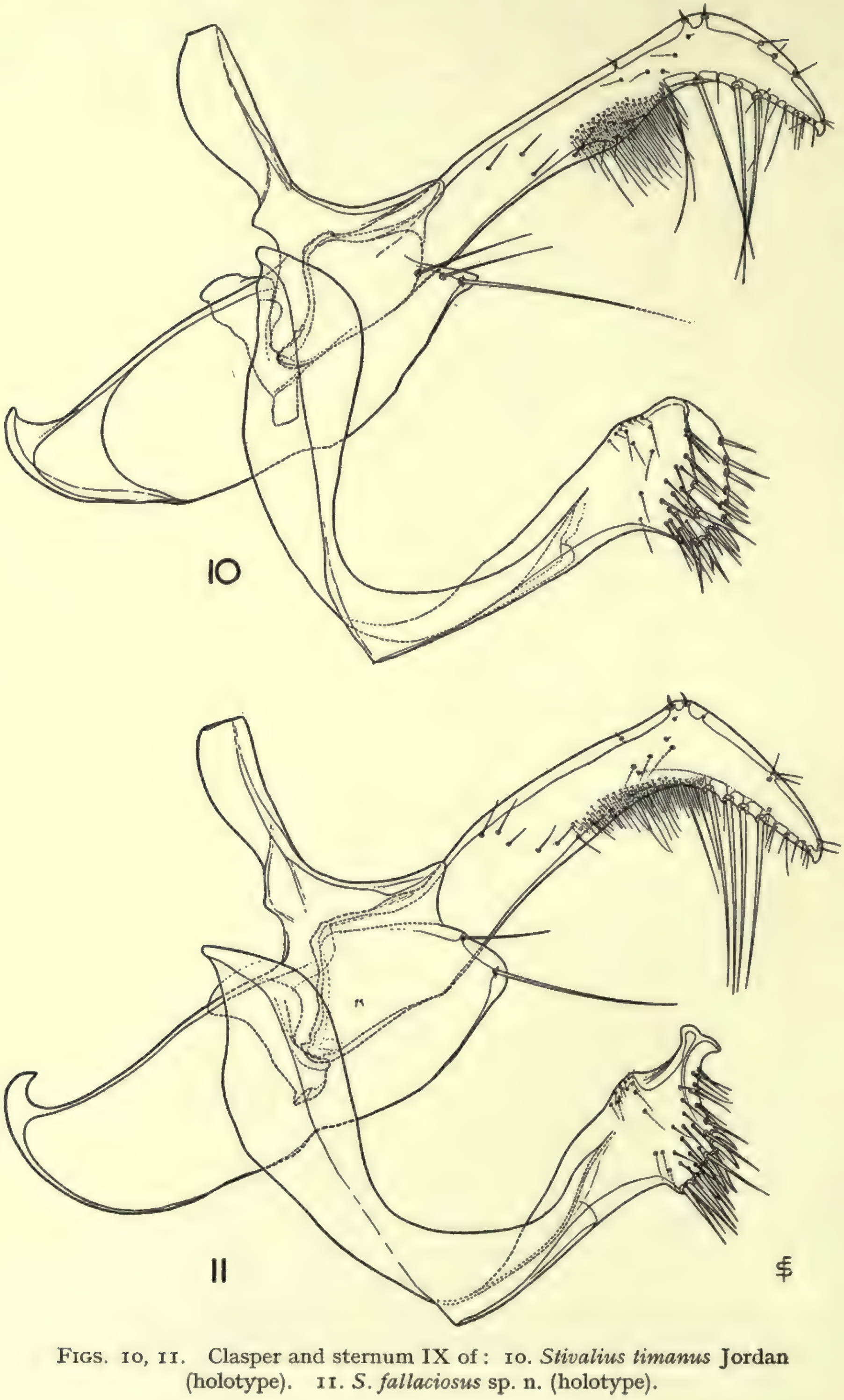


FIGS. 8, 9. Clasper and sternum IX of: 8. *Stivalius torvus* (Rothschild) (Keruguya, Kenya). 9. *S. parilis* sp. n. (holotype).

rats, 1931, 1 ♀ (MCB); Blukwa, 1940, 1 ♀ (MCB); Blukwa, *Rattus* (*Mastomys*) *natalensis ugandae*, ii. 1935, 1 ♂; Lombu nr. Blukwa, *Rattus* (*Mastomys*) *natalensis ugandae*, 19.xii.1945, 1 ♀ (MCB); Rakwa nr. Blukwa, *Rattus* (*Mastomys*) *natalensis ugandae*, 9.x.1945, 1 ♂ (MCB) ; Drodro nr. Blukwa, *Arvicanthis abyssinicus* 2.ix.1945, 1 ♂ (MCB); Lotomukubwa nr. Blukwa, *Arvicanthis abyssinicus*, 15.x.1945, 1 ♂ (MCB); Costermansville, Kivu district, rats, 1940, 1 ♂, 1 ♀; Lubero, Kivu, field rats, xii.1940, 3 ♂, 3 ♀; Lubero, 1950, 2 ♂, 1 ♀; Boyoro region, Geti-Boga, *Rattus* (*Mastomys*) *natalensis ugandae*, iv.1929, 1 ♂, 1 ♀ (and 1 ♂, 1 ♀ MCB); Dilolo, Katanga, *Tatera valida*, *Rattus* (*Mastomys*) *natalensis*, 1934, 2 ♂, 2 ♀ (and 1 ♂, MCB) (Jordan, 1936 : 297); Lukolela, Tshuapa district, *Crocidura occidentalis*, 1 ♂ (Jordan, 1937 : 290); Elisabethville, Katanga, 1935, 1 ♀; the following are all from the neighbourhood of Elisabethville: *Crocidura pilosa*, 1 ♀; *Steatomys pratensis*, 1 ♂; *Saccostomus campestris*, 5 ♂, 2 ♀; *Rattus* (*Praomys*) *morio jacksoni*, 2 ♂, 4 ♀; *Tatera valida*, 1 ♀; *Aethomys chrysophilus*, 1 ♀; *Mus triton*, 1 ♀; *Pelomys fallax*, 2 ♀; *Rattus* (*Mastomys*) *natalensis ugandae*, 12 ♂, 16 ♀; *Lophuromys flavopunctatus major*, 1 ♂, 2 ♀ (all these specimens were collected by P. L. Pirlot in 1957); nest of *Steatomys pratensis*, x.1956, 20 ♂, 32 ♀; *Saccostomus campestris*, 12.iv.1956, 1 ♂; *Rattus* (*Mastomys*) *natalensis*, iii.1956, 1 ♂, iv.1956, 1 ♀ (these specimens were collected by M. Lips; part of the Pirlot and Lips material has been generously presented by the Tervuren Museum to the British Museum collection of fleas at Tring).

DESCRIPTION. HEAD (Text-fig. 2). Frontoclypeal margin smoothly rounded. Preoral tuber short, though a little longer than in *S. alienus* (Text-fig. 1). Submarginal frontal row consisting of six setae in both sexes; between this row and the eye there are 12–16 large and fairly large setae, while there are many minute setae situated between the frontal row and the next irregular row and also along the anterior margin of the antennal fossa. Genal margin below the eye entire, not divided into two small lobes. Eye well-developed, kidney-shaped. Maxillary palp reaching to about the middle of the anterior margin of the fore coxa; the first two segments of this palp of subequal length, the third segment the shortest. The laciniae are smooth basally and finely serrated apically. The labial palp, reaching to about three-fourths the length of the fore coxa, consists of five segments. Scapus of antenna with six to nine setae on the outer surface of its widened portion in the male and three to four in the female; pedicellus in both sexes with six to nine slender setae, several of which reach to or a little beyond the first segment of the clava. Postantennal region of head with three rows of setae and a large seta about mid-way between the lowest seta of the second row (the latter seta is moved considerably forward) and that of the third row; in both sexes the first occipital row consists of six setae, the second and third rows of six or seven. Bordering the antennal fossa posteriorly are about 16–20 small setae in the male, 20–25 in the female.

THORAX. Pronotum (Text-fig. 2) dorsally about as long as the dorsal spines of the ctenidium, with two rows of setae, the anterior of which does not extend downwards on to the ventral half of the pronotum and consists of five to seven short setae each side, while the main row consists of six setae each side in both sexes. Pronotal ctenidium with 22–24 spines (occasionally 20, 21 or 25). Mesonotum with



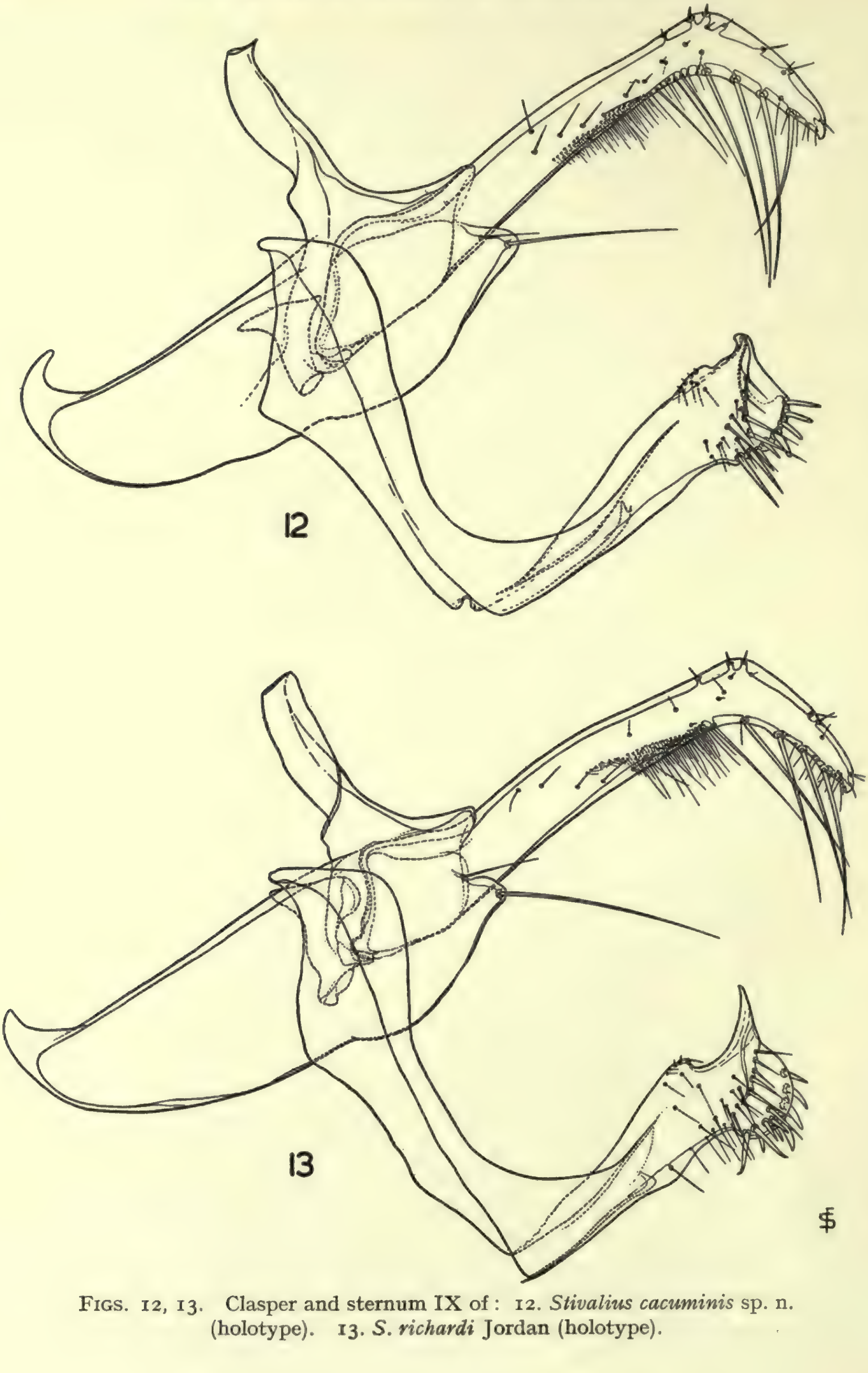
FIGS. 10, 11. Clasper and sternum IX of: 10. *Stivalius timanus* Jordan (holotype). 11. *S. fallaciosus* sp. n. (holotype).

a main row of five setae each side, preceded by three rows of smaller setae ; two fairly long pseudosetae present under the dorsal portion of the mesonotal collar. Mesepisternum with three to five small and one large seta, the latter is often placed opposite the internal rod or even beyond this and is then actually on the mesepimeron ; mesepimeron with six or seven setae. Metanotum with four rows of setae, the first row being short and irregular ; the main row has six setae each side, the lowest of which is the shortest. Pleural arch well developed. Metepisternum with one large and one or two small setae ; metasternum dorso-posteriorly with one large and one or two small setae ; metepimeron with about five small and nine to ten large setae in the male, five or six small and 11–13 large setae in the female.

LEGS. Chaetotaxy and structure of coxae and femora more or less as in *S. alienus*. Fore tibia with seven groups of setae in notches of the posterior (dorsal) margin, the groups consisting from base to apex of 3, 3, 1, 3, 3, 3 and 3 setae respectively ; mid tibia with eight groups : 2, 2, 2, 2, 3, 1 (usually not in a notch), 3 and 3 setae ; hind tibia (Text-fig. 4) with eight groups : 2, 2, 1 (or 2), 3, 3, 1, 3 and 3 setae respectively. Fifth segment of all tarsi with the chaetotaxy usual for the genus.

ABDOMEN. Tergum I with four rows of setae ; terga II–VII with three rows each, but the first row often very irregular. The numbers of setae in the main row on each side of terga I–VII are in the male 5, 7, 7, 7, 7, 7 and 7 respectively, in the female 5, 7, 8, 8, 8, 7 and 4 (or 5). Terga II–V in both sexes with one subdorsal marginal spinelet each side. Both sexes with two antesensilial setae, the lower of which is about twice the length of the upper ; in the female the margin of tergum VII between the two groups of antesensilials forms a triangular lobe ; below the antesensilials the margin is angulate. Basal abdominal sternum with a lateral patch of one to five small setae in the male and 12–25 in the female, and along the ventral margin four setae each side forming a horizontal row. Sterna III–VII in the male normally with three large setae on each side in the rather irregular main row ; in the female the main row of sterna III–VI consists of three or four setae ; in both sexes these main rows are preceded by a patch or numerous smaller setae.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. MALE (Text-figs. 8, 17). Tergum VIII with four to six setae each side anterior to the vertical part of the spiracular fossa. Sternum VIII with about 30–35 setae each side and a group of three stout and two small closely set setae apically at the ventral margin. Apodeme of tergum IX narrow in its upper part, its lower portion not solidly fused with the corpus of the clasper (Text-fig. 8). Manubrium broad, tapering only weakly, with an upturned apex. Fixed process of clasper with one long and one short acetabular seta. A dark T-shaped sclerite present between the bases of the two manubria. Movable process of the shape which is usual in the genus, long and narrow and with its apical portion turned downwards ; with an area of densely set thin and moderately long setae on the inner side bordering the ventral margin, also along this margin, but beyond the bend, are four or five (sometimes only three) long setae. The ventral margin of the movable process gently convex in the setose portion (Text-fig. 8) or practically straight. Distal arm of sternum IX (Text-fig. 8) apically widened, with numerous short setae, many of which are thickened, along the apical margin and unmodified ones on the adjoining lateral portion ; dorsally the apical part of the arm bears



FIGS. 12, 13. Clasper and sternum IX of: 12. *Stivalius cacuminis* sp. n. (holotype). 13. *S. richardi* Jordan (holotype).

a patch of very small setae on the inner side. Phallosome as in Text-fig. 17; the tendons of the phallosome make about half a convolution, the inner tube is short and thick-walled and the dorso-apical aedeagal sclerite is of a characteristic shape and structure; the aedeagal apodeme is very broad but preapically the dorsal margin is strongly concave.

FEMALE (Text-figs. 26, 28, 38, 39, 53, 54). Posterior margin of sternum VII with a large sinus, which divides the main row of four or five setae into two upper and two or three lower; in front of this main row are numerous smaller setae (Text-figs. 38, 39). Variation in the outline of the posterior margin of sternum VII is as shown in Text-figs. 38, 39. Tergum VIII with about 8–12 setae in front of the vertical part of the spiracular fossa; chaetotaxy of the ventral part of this tergum as in Text-fig. 53. The posterior margin of tergum VIII has a marked noselike projection, the variation of which is shown in Text-fig. 54. Sternum VIII as in Text-fig. 28. Anal stylet about four to five times as long as its maximum width, with one long apical and two minute preapical setae. Bulga of spermatheca (Text-figs. 26, 28) roughly rectangular, dorsally with a smoothly rounded but rather variable hump; the hilla, bearing a papilla, is much narrower and also shorter than the bulga; both the bulga and the the basal half of the hilla have thick or very thick walls. On each side of the bursa copulatrix is a dark and usually triangular (not longitudinal) sclerite (Text-figs. 26, 28). The relatively short dilated part of the ductus spermathecae has a thick wall and is provided internally with numerous membranous rings (Text-fig. 26).

LENGTH. ♂ 2½–3½ mm., ♀ 3–4 mm.

Stivalius richardi Jordan, 1936

(Text-figs. 13, 21, 30, 41, 61)

Stivalius richardi Jordan, 1936, *Novit. zool.* **39**: 298, figs. 57, 58.

MATERIAL EXAMINED. Male holotype from Dilolo, Katanga, Belgian Congo, from *Malacomys longipes*, 1934; female allotype, same locality and date, from *Steatomys pratensis*. The allotype is in the Musée Royal du Congo Belge at Tervuren.

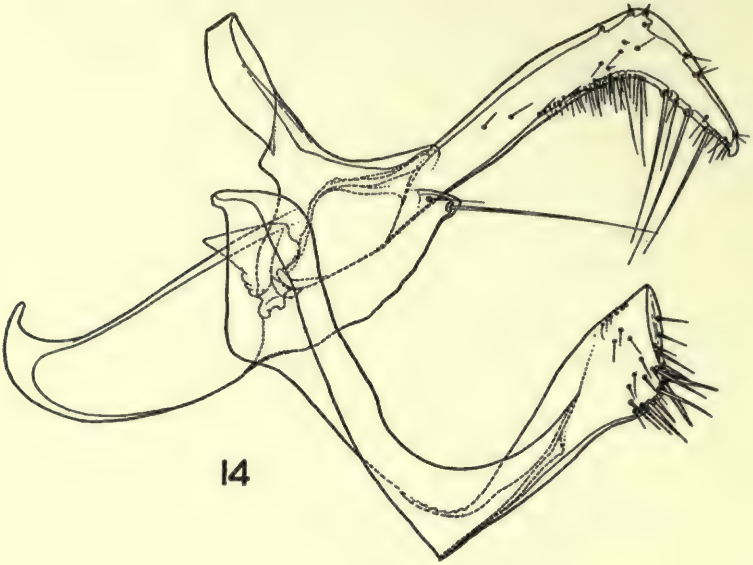
DESCRIPTION. HEAD. Approximately as in *S. torvus*, but the frons is a little more strongly rounded, and there are fewer small setae bordering the antennal fossa dorsally (14–15 in the male, 17–20 in the female).

THORAX. Pronotal ctenidium in both sexes consisting of 24 spines which are somewhat shorter than the pronotum; in other respects the thorax resembles that of *S. torvus*.

LEGS. Fore tibia with seven groups of setae in notches of the posterior (dorsal) margin, the groups consisting from base to apex of 2, 2, 1, 3, 3, 2 and 3 setae respectively; mid tibia with eight groups: 3, 2, 1, 3, 3, 1, 3 and 3 setae; hind tibia with eight groups: 3, 2, 2, 3, 3, 1, 3 and 4 setae.

ABDOMEN. Segments I–VII as in *S. torvus*.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. MALE (Text-figs. 13, 21). Tergum VIII with five to eight setae each side in front of the vertical part of the spiracular fossa. Sternum VIII with about 40 setae each side and the usual ventro-



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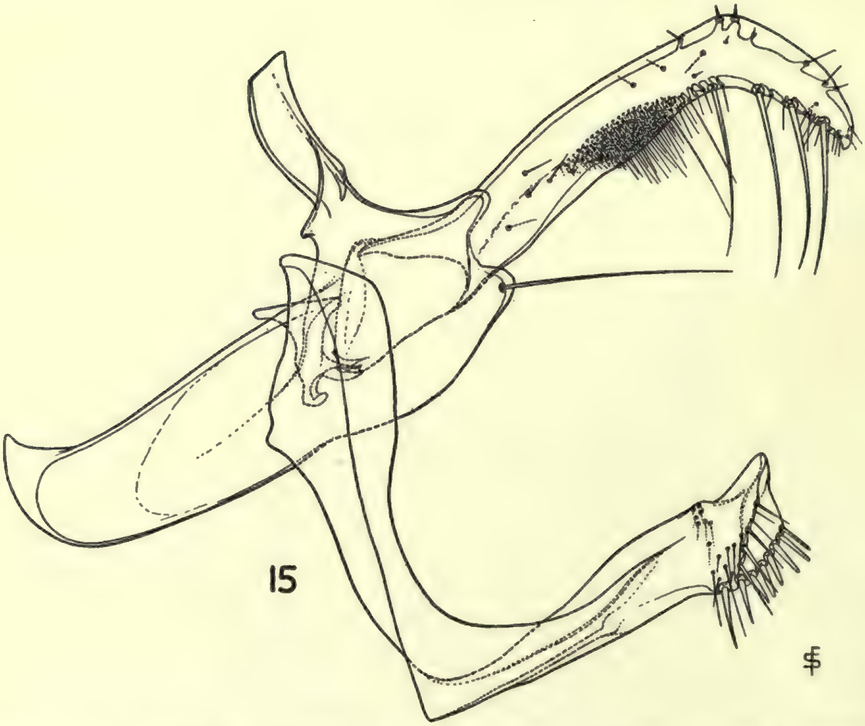

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FIGS. 14, 15. Clasper and sternum IX of: 14. *Stivalius sellatus* Jordan & Rothschild (Torit, Sudan). 15. *S. pirloti* sp. n. (holotype).

marginal group of several short and stout setae. Apodeme of tergum IX as in *S. torvus* ; manubrium broad, tapering more distinctly than in *S. torvus* ; fixed process of clasper with one short and one long acetabular seta ; movable process (Text-fig. 13) almost like that of *S. torvus* but longer and slenderer and the dense group of setae not extending nearly so far away from the margin in *S. richardi*. Apex of distal arm of sternum IX (Text-fig. 13) produced dorsally into a long and sharply pointed spike ; chaetotaxy of the distal arm as shown in Text-fig. 13. Aedeagus as in Text-fig. 21 ; the tendons of the phallosome make about half a convolution, the short inner tube has a very thick dorsal wall and the dorso-apical aedeagal sclerite is very large.

FEMALE (Text-figs. 30, 41, 61). Sternum VII as in Text-fig. 41. The ventral and posterior margins of tergum VIII meet at about a right angle without forming a projection ; noselike projection of the posterior margin of tergum VIII rounded-off (Text-fig. 61) ; chaetotaxy of this tergum approximately as in *S. torvus*. Sternum VIII rather narrow apically (Text-fig. 30). Anal stylet only three and a half times as long as its maximum width. Bulga of spermatheca (Text-fig. 30) thick-walled, almost without a dorsal hump ; hilla with a large papilla. The sclerite on each side of the bursa copulatrix is exceptionally large and dark and is shaped like the sole of a shoe, in the only known specimen, covering the short dilated part of the ductus spermathecae almost completely (Text-fig. 30).

LENGTH. ♂ 3½ mm., ♀ 4 mm.

Stivalius curtiductus sp. n.

(Text-figs. 29, 40, 62)

TYPE MATERIAL. Female holotype from Mt. Tonkoni nr. Man, Ivory Coast, 900–1,200 m., 20–30.ix.1946, A. Villiers.

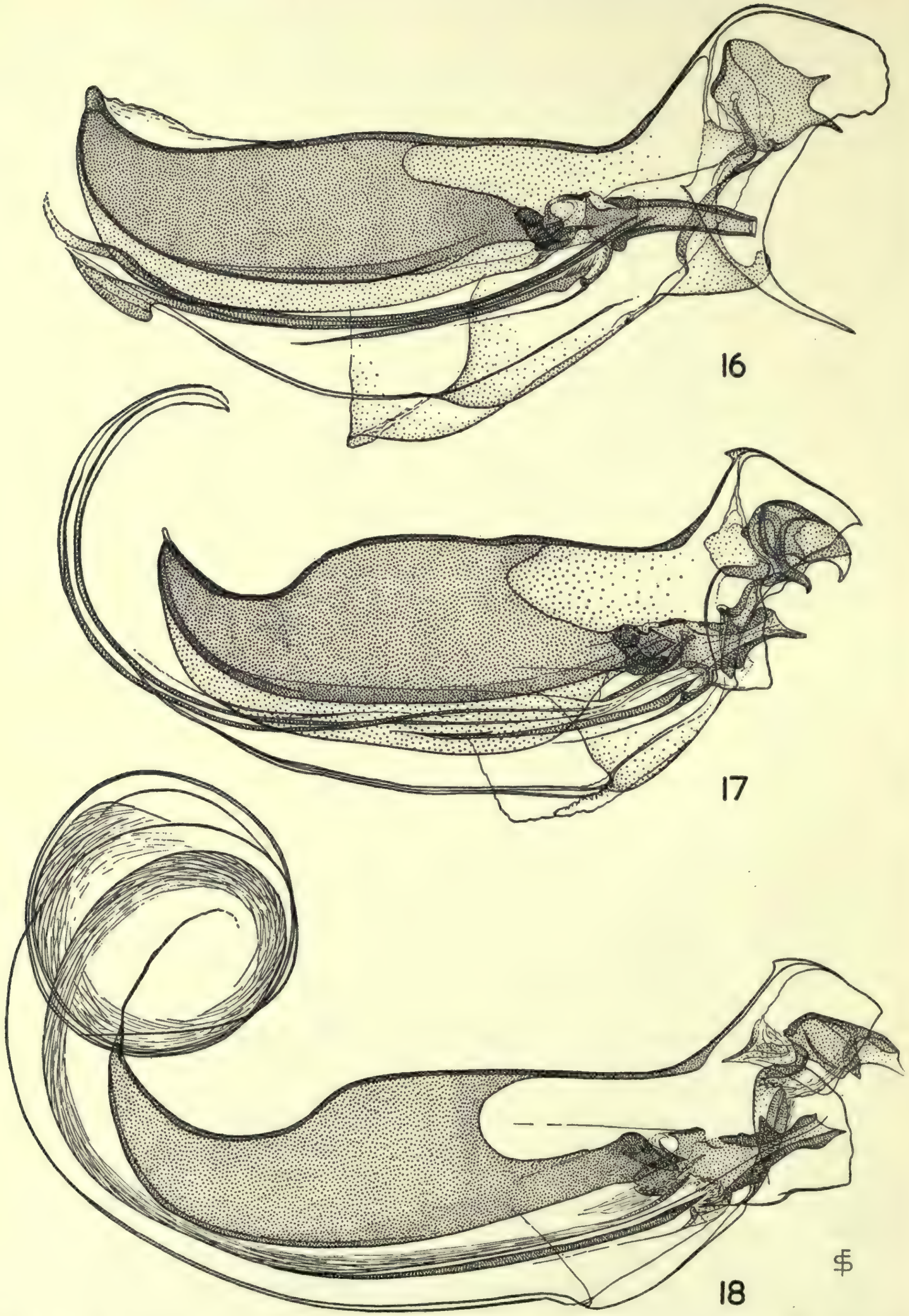
DIAGNOSIS. The female of this new species (the male is unknown) is easily distinguishable from other species of the *torvus*-group by the pronotal spines being much shorter than the pronotum, the far downwards extension of the first row of setae on the pronotum, and the sharp ventro-apical angle of tergum VIII.

DESCRIPTION. HEAD. Eye kidney-shaped, but a little more rounded than in *S. torvus*. The laciniae are somewhat more coarsely serrated than in the latter species, and the serration extends from the tip of the laciniae to about the middle. In other respects the head resembles that of *S. torvus*.

THORAX. Pronotum dorsally considerably longer than the spines of the pronotal ctenidium, with two rows of setae, the first row of eight or nine setae each side extends downwards well below the middle of the pronotum ; the second row consists of six setae each side ; pronotal ctenidium with 23 spines. Mesothorax and metathorax essentially as in *S. torvus*.

LEGS. The fourth group of setae (counted from the base) of the mid tibia bears three setae (two in *S. torvus*) ; otherwise the legs are like those of *S. torvus*.

ABDOMEN. Dorsally in front of the three rows of tergal setae are several irregularly



FIGS. 16–18. Phallosome of: 16. *Stivalius alienus* sp. n. (holotype). 17. *S. torvus* (Rothschild) (Keruguya, Kenya). 18. *S. timanus* Jordan (holotype).

placed setae, while the first two rows are also rather irregular. Tergum VI with eight setae in the main row each side (seven in *S. torvus*). The upper of the two antesensilial setae is about half the length of the lower on one side of the specimen and slightly more than half on the other. Basal abdominal sternum with a lateral patch of about 25 setae each side ; the main row on sterna III–VI consists of four or five setae. In other respects the unmodified abdominal segments are like those of *S. torvus*.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. FEMALE (Text-figs. 29, 40, 62). Posterior margin of sternum VII (Text-fig. 40) with a rather deep sinus, the lobe above it is obtuse. Tergum VIII with 12 or 13 setae in front of the spiracular fossa. Noselike projection of the posterior margin of tergum VIII weakly developed ; the ventro-apical angle of this tergum very sharp (Text-fig. 62). Sternum VIII as in Text-fig. 29. Anal stylet nearly five times as long as its maximum width, with two minute preapical setae and a fairly long apical seta. Bulga of spermatheca with a fairly thick wall, and a small dorsal hump ; the sclerite on each side of the very small bursa copulatrix is almost undeveloped (Text-fig. 29). The dilated basal portion of the ductus spermathecae is broad and short and resembles that of *S. torvus*, but it has a thin wall ; the remainder of this duct is also very short (Text-fig. 29).

LENGTH. ♀ 4 mm.

Stivalius vancanneyti Berteaux, 1947

(Text-figs. 31, 42, 55)

Stivalius vancanneyti Berteaux, 1947, *Rev. Zool. Bot. Afr.* **40** : 105, fig. 9.

MATERIAL EXAMINED. Female holotype, Djugu, Ituri, Belgian Congo, from *Heliosciurus ruwenzori*, collected by R. van Canneyt. The holotype is in the Musée Royal du Congo Belge, Tervuren.

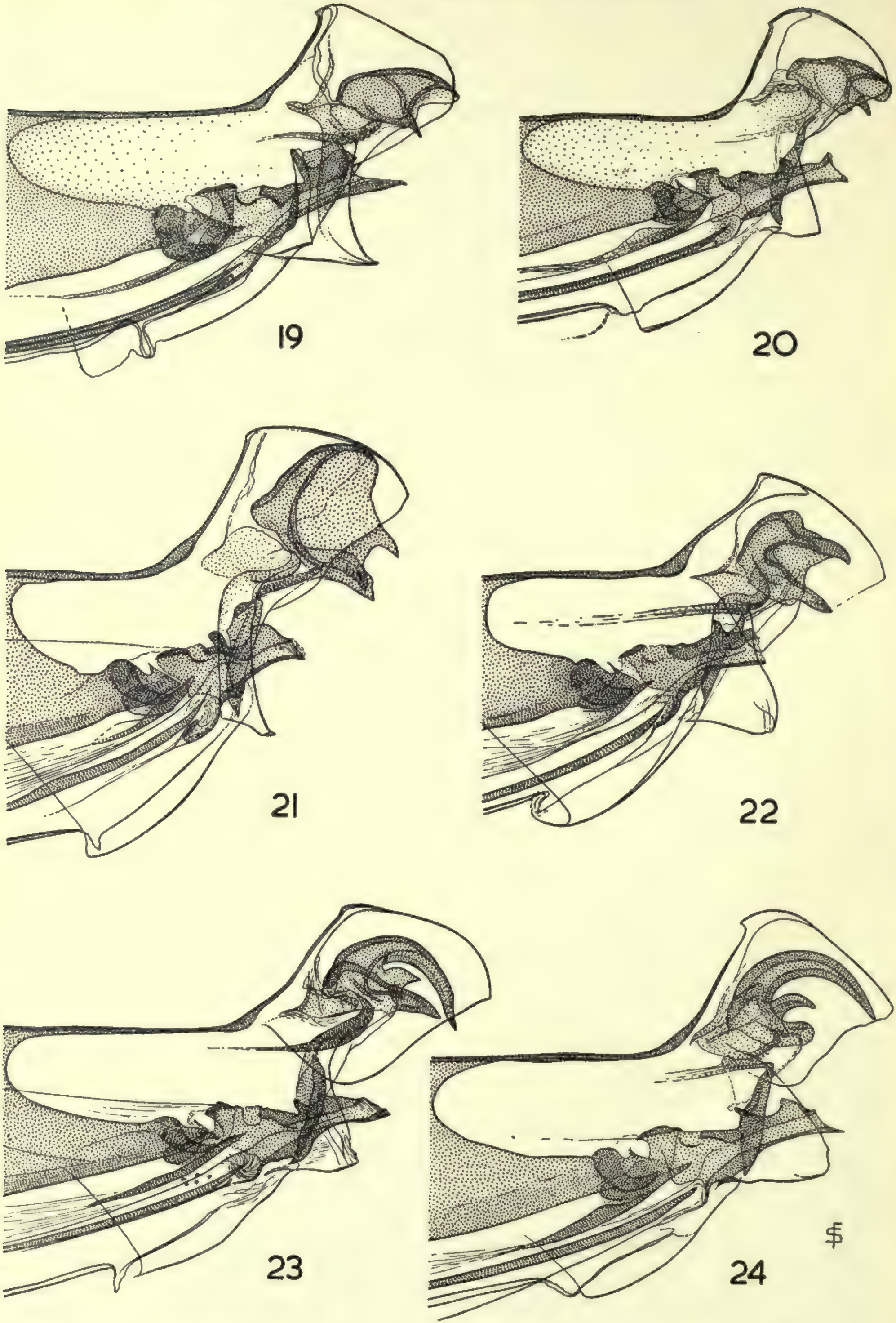
DESCRIPTION. HEAD. Frons rather strongly rounded ; chaetotaxy of head similar to that of *S. torvus*. The five-segmented labial palp reaches to the apex of the fore coxa.

THORAX. Pronotum dorsally one and a third longer than the dorsal spines of the pronotal ctenidium ; with two rows of setae, the main row consisting of five setae each side. Pronotal ctenidium consisting of 22 spines. In other respects the thorax is similar to that of *S. torvus*.

LEGS. Chaetotaxy approximately as in *S. torvus* ; in the fourth notch from the base of the hind tibia the anterior of the three setae is displaced downward on both sides of the specimen, but this is possibly abnormal.

ABDOMEN. Unmodified segments as in *S. torvus*.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. FEMALE (Text-figs. 31, 42, 55). Sternum VII as in Text-fig. 42. A patch of ten setae each side anterior to the spiracular fossa of tergum VIII ; ventro-posterior angle of tergum VIII (Text-fig.



Figs. 19–24. Aedeagus of: 19. ***Stivalius parilis*** sp. n. (holotype). 20. *S. sellatus* Jordan & Rothschild (Torit, Sudan). 21. *S. richardi* Jordan (holotype). 22. *S. fallaciosus* sp. n. (holotype). 23. *S. pirloti* sp. n. (holotype). 24. *S. cacuminis* sp. n. (holotype).

55) rounded off, not forming a projection ; posterior margin of tergum VIII with a well-developed noselike projection. Sternum VIII as in Text-fig. 31. Anal stylet about four times as long as basally broad. Genitalia as in Text-fig. 31 ; the dilated portion of the ductus spermathecae as wide as in *S. torvus, richardi* and *curtiductus* but more than twice as long as in any of these three species. Spermatheca so unfavourably placed that its characteristics cannot be made out satisfactorily.

LENGTH. ♀ 4½ mm.

Stivalius afer (Rothschild), 1908

(Text-figs. 32, 43, 56)

Pygiopsylla afer Rothschild, 1908, *Proc. zool. Soc. Lond.* (**1908**) : 618, Pl. 29, figs. 7, 8.

Stivalius afer Jordan & Rothschild, 1922, *Ectoparasites*, **1** : 250, 264, fig. 240 (*partim* ; the description and figure of the male pertain to the next new species) ; Dalla Torre, 1924, *Ber. naturw. med. Ver. Innsbruck*, **39** : 11 ; Bedford, 1932, *Rep. Vet. Res. S. Afr.* **18** : 449 (*partim*) ; Jordan, 1936, *Novit. zool.* **40** : 93 (*partim*) ; Jordan, 1948, in Smart, *Insects of medical importance* (London) : 240.

Stivalius afer afer Jordan, 1938, *Novit. zool.* **41** : 115, 116.

MATERIAL EXAMINED. Female holotype from Benguela Province, Angola, 200 miles from the coast, 4,780 ft., host not known, F. C. Wellman.

DESCRIPTION. HEAD. As in *S. torvus*, but in the only known specimen the eye is oval, not kidney-shaped.

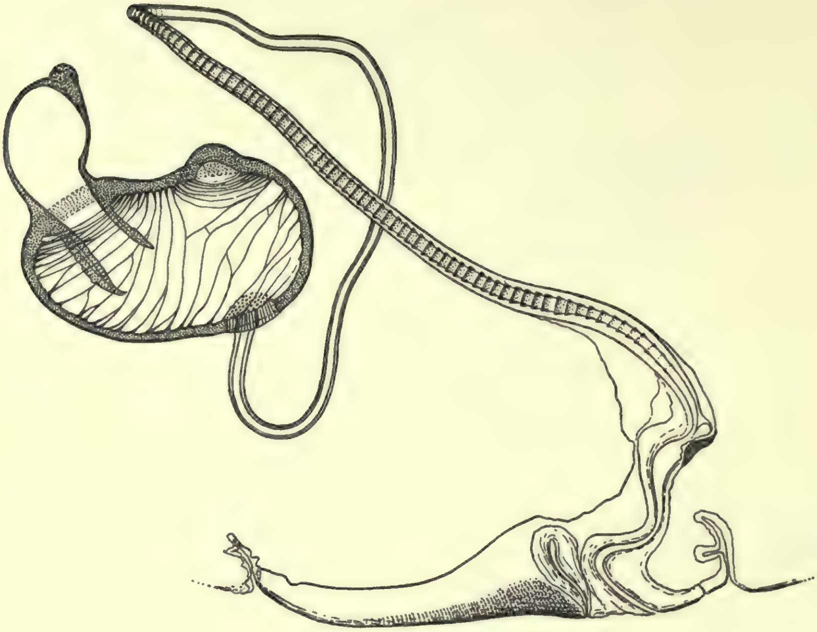
THORAX. As in *S. torvus* ; pronotal ctenidium consisting of 24 spines ; metepimeron on one side with 11 small and 11 larger setae, on the other with nine small and 12 larger setae.

LEGS. Essentially as in *S. torvus*, but on the dorsal margin of the mid tibia the fourth notch from the base has three setae instead of two and the single seta of the sixth group is marginal.

ABDOMEN. Terga II–VII with four rows of setae, but the first row is represented by only a few dorsal setae ; in other respects the unmodified abdominal segments are like those of *S. torvus*.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. FEMALE (Text-figs. 32, 43, 56). Sternum VII as in Text-fig. 43. The noselike angle of the posterior margin of tergum VIII (Text-fig. 56) is less marked than in *S. torvus*. Apex of sternum VIII with several fairly long setae (Text-fig. 32). Dorsal margin of the bulga of the spermatheca without a definite hump but with a concavity defining an ill-marked posterodorsal rounded bulge ; the base of the hilla protruding slightly into the lumen of the bulga (Text-fig. 32). The sclerite on each side of the bursa copulatrix is long and narrow, much longer than the bursa. The dilated portion of the ductus spermathecae long and relatively narrow, with a thin wall (Text-fig. 32).

LENGTH. ♀ 3¾ mm.



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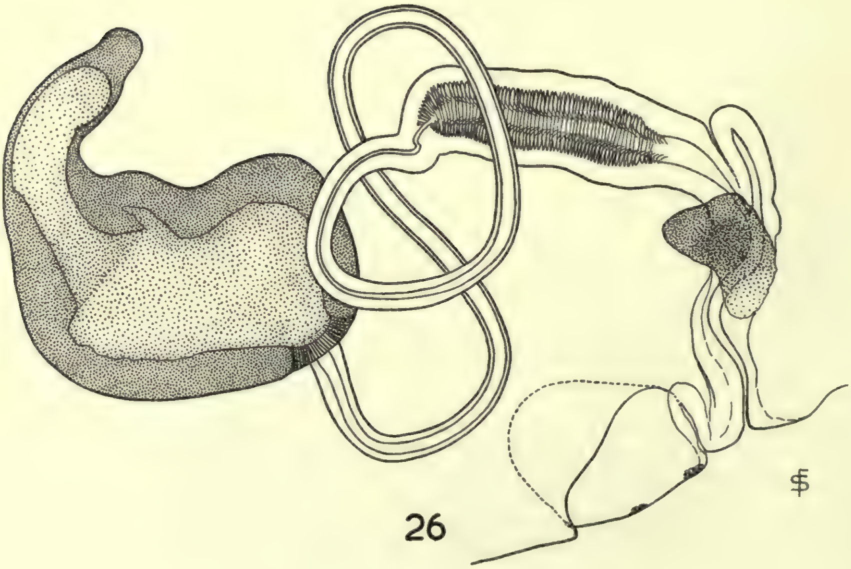

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FIGS. 25, 26. Female genitalia of: 25. *Stivalius alienus* sp. n. (paratype, nr. Elisabethville) 26. *S. torvus* (Rothschild) (Keruguya, Kenya).

Stivalius parilis sp. n.

(Text-figs. 9, 19, 33, 44, 57)

Stivalius "*afer*" Jordan & Rothschild, 1922, *Ectoparasites*, **1** : 250, 264, fig. 240 (*partim* ; specimens from N'Dala Tando, Angola) ; Bedford, 1932, *Rep. Vet. Res. S. Afr.* **18** : 449 (*partim*) ; Jordan, 1936, *Novit. zool.* **40** : 93 (*partim*).

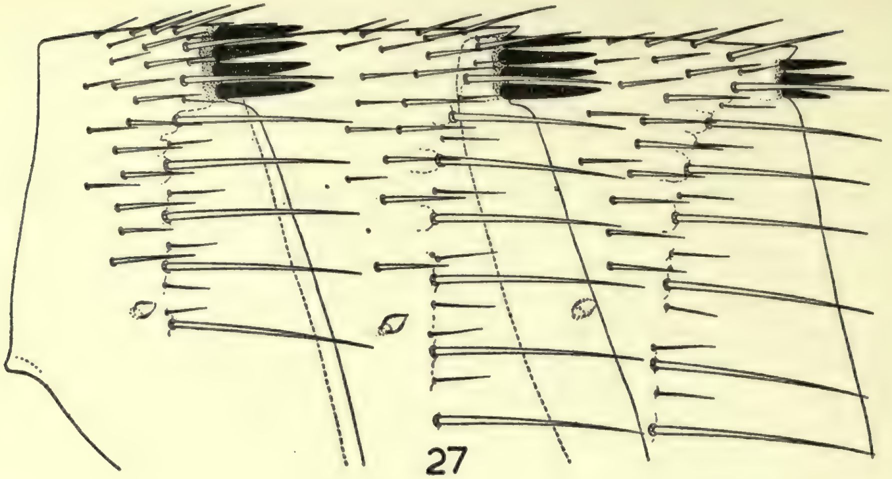
TYPE MATERIAL. Male holotype, female allotype, one male paratype and one female paratype from N'Dala Tando (also spelt Dalla Tando or Dala Tando), Loanda, Angola, from *Arvicanthis niloticus rufinus*, 18.xii.1908, W. J. Ansorge.

DIAGNOSIS. Nearest related to *Stivalius afer* and differing from it in the female sex (the male of *S. afer* is unknown) especially by the fact that the bursa copulatrix is as large as the sclerites associated with it. Some other apparent differences are mentioned in the description.

DESCRIPTION. Head, thorax, legs and unmodified abdominal segments as in *S. afer*, except that the eye is kidney-shaped instead of oval, the single seta of the sixth group of the mid tibia is not marginal and the dorso-marginal spinelets of tergum V are small or absent. The pronotal ctenidium consists of 24 spines in both sexes, as in the only known specimen of *S. afer*.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. MALE (Text-figs. 9, 19). Tergum VIII with four or five setae each side anterior to the vertical part of the spiracular fossa. Sternum VIII with about 31–36 setae each side and a group of three stout and several smaller ventro-apical setae. Apodeme of tergum IX very narrow in its dorsal portion, its lower portion not solidly fused with the rest of the clasper (Text-fig. 9). Manubrium fairly broad, feebly tapering, with an upturned apex. Fixed process of clasper with one long and one short acetabular seta. The long straight part of the movable process is slightly convex dorsally and ventrally, with a dense patch of thin setae on the inner surface along the posterior part of the straight ventral margin ; the ventral margin of the turned-down tip bears three or four long setae, the most distant of which is not far from the apex. Apex of distal arm of sternum IX only slightly widened, with a bluntly triangular dorso-apical angle and a number of lateral and marginal setae (Text-fig. 9). Aedeagus as in Text-fig. 19 ; dorsal wall of inner tube extremely thick ; ventro-lateral projection of the outer wall of the aedeagus with an acute ventro-posterior angle ; aedeagal apodeme broad but the dorsal margin strongly concave pre-apically, the apex produced into a tendril-like structure ; the tendons of the phallosome form several convolutions.

FEMALE (Text-figs. 33, 44, 57). Posterior margin of sternum VII (Text-fig. 44) with a large sinus, which divides the main row of six setae into two groups, each of three setae, in front of this main row are numerous smaller setae. Tergum VIII with about six to eight setae in front of the vertical part of the spiracular fossa ; chaetotaxy of the lower part of tergum VIII similar to that of related species. Noselike angle of the posterior margin of tergum VIII rounded off (Text-fig. 57). Sternum VIII as in Text-fig. 33. Anal stylet with a long apical seta and only one minute preapical seta at the dorsal margin. Bulga of spermatheca (Text-fig. 33) rather long, with a relatively thin wall and without a marked dorsal hump ; hilla with a papilla.



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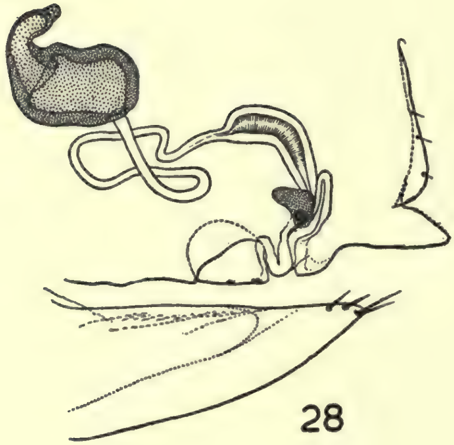

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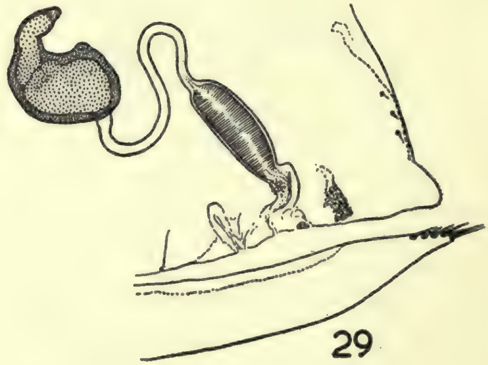

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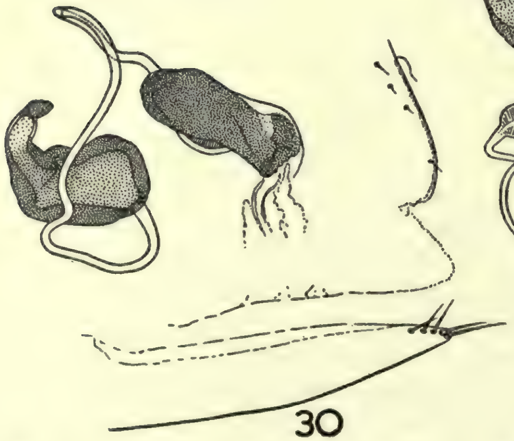

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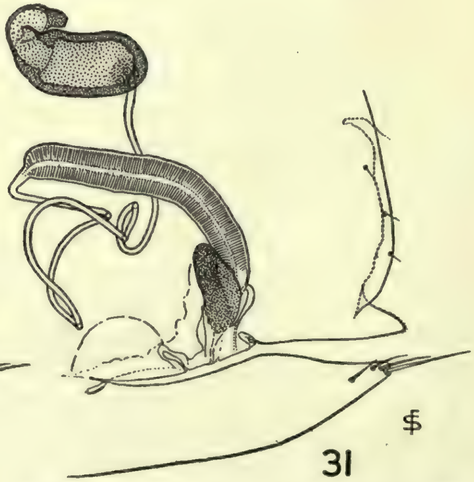

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FIG. 27. *Stivalius pirloti* sp. n. (allotype), terga II–IV. Figs. 28–31. Sternum VIII and IX and genitalia of: 28. *S. torvus* (Rothschild) (Keruguya, Kenya). 29. *S. curtiductus* sp. n. (holotype). 30. *S. richardi* Jordan (allotype). 31. *S. vancanneyti* Berteaux (holotype).

The sclerite on each side of the bursa copulatrix is roughly ellipsoid and about as large as the bursa ; the dilated part of the ductus spermathecae is long and narrow and has fairly thick walls.

LENGTH. ♂ 3½ mm., ♀ 3½–4 mm.

Stivalius timanus Jordan, 1938

(Text-figs. 10, 18, 34, 45, 46, 58)

Stivalius afer timanus Jordan, 1938, *Novit. zool.* **41** : 115, figs. 60, 61.

MATERIAL EXAMINED. From Georgewater Spur[1], Freetown, Sierra Leone : male holotype from *Rattus* (*Praomys*) *morio tullbergi*[1], 27.ii.1937, female allotype from the same host species, 1.iii.1937, one female paratype from *Lophuromys sikapusi*[1], 25.ii.1937 ; all collected by D. H. S. Davis.

DESCRIPTION. HEAD. Frons more strongly rounded than in related species. In other respects the head resembles that of *S. torvus*.

THORAX. Pronotal ctenidium with 23 spines in the male holotype, 24 in the two available females ; the dorsal spines are a little shorter than the dorsal length of the pronotum. The lower of the two pseudosetae each side under the collar of the mesonotum is separated by a clear gap from the upper.

LEGS AND UNMODIFIED ABDOMINAL SEGMENTS. As in *S. torvus*.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. MALE (Text-figs. 10, 18). Tergum VIII of holotype with three setae on one side, four on the other ; sternum VIII with 31 setae on one side, 36 on the other, and the usual group of four to seven short setae apically along the ventral margin. Apodeme of tergum IX as in related species. Manubrium broad, with an upturned tip. Three acetabular setae on one side, two on the other (the latter is doubtless the normal number). Movable process (Text-fig. 10) long and slender, with a straight dorsal margin and a smoothly undulating ventral margin ; with a dense patch of longish thin setae on the inner side adjacent to the convex part of the ventral margin ; the ventral margin of the turned-down apical portion with three long setae, the most apical of which is well away from the apex. Distal arm of sternum IX (Text-fig. 10) ventro-apically strongly widened without a dorso-apical projection, with a number of short setae several of which are spiniform. Phallosome as in Text-fig. 18 ; the tendons of the phallosome make two convolutions ; the aedeagal inner tube has a relatively thin dorsal wall ; the dorso-apical sclerite is rather small ; the aedeagal apodeme is broad, the apical half of its dorsal margin is strongly concave, and its tip is drawn out into a long tendril-like structure.

FEMALE (Text-figs. 34, 45, 46, 58). Sternum VII with the sinus almost as in related species, but the lobe above the sinus relatively long ; variation in the outline of the posterior margin of sternum VII as in Text-figs. 45, 46. Tergum VIII with five to seven setae in front of the vertical portion of the spiracular fossa. Noselike angle of the posterior margin of tergum VIII distinct (Text-fig. 58), but less so than in *S. torvus*. Sternum VIII rather broad, narrowing abruptly a little before the apex

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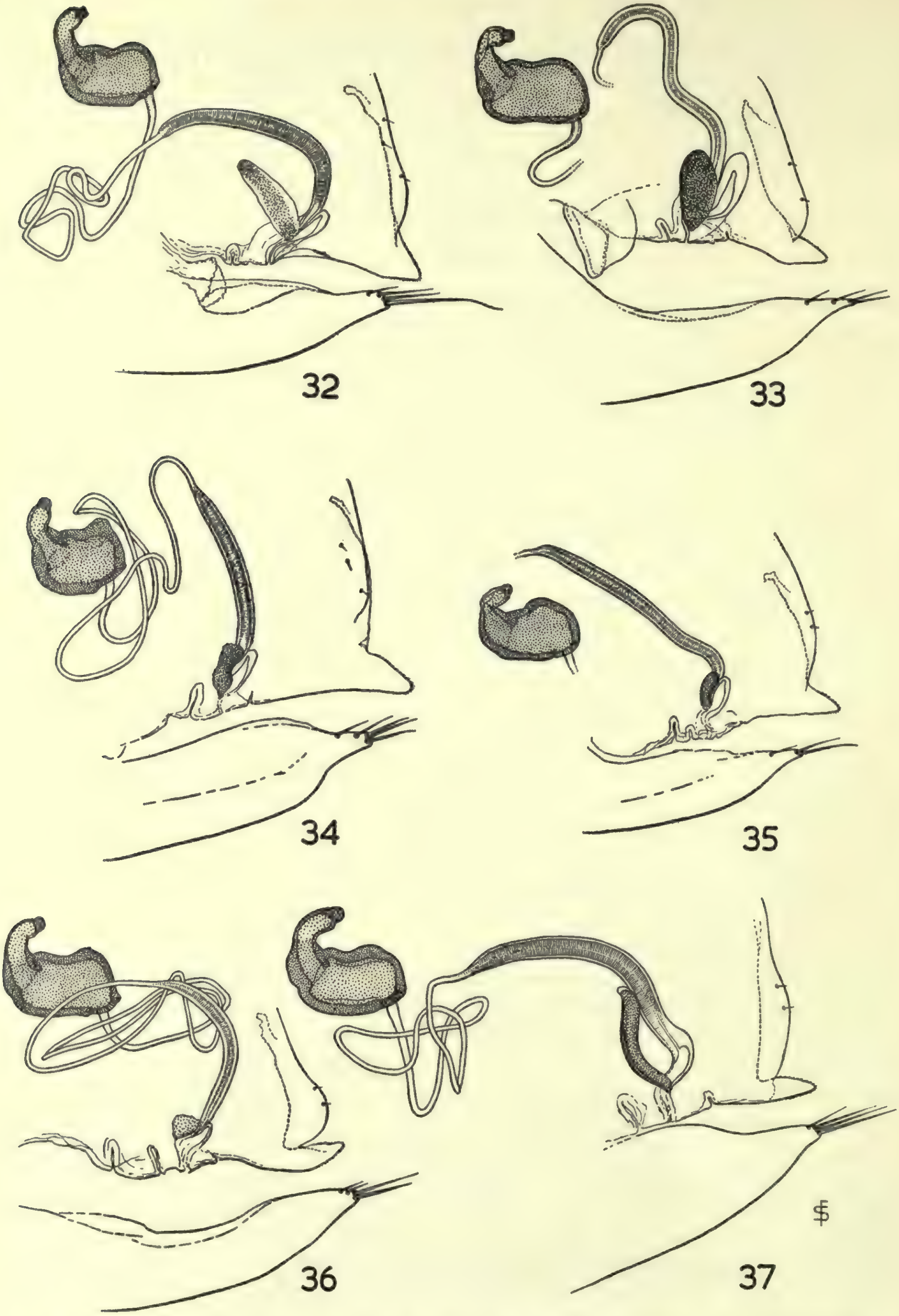
[1] The names of the exact locality and of the hosts, as well as the dates of capture, were not available for the original description, but recently Dr. D. H. S. Davis has kindly supplied these additional data.



Figs. 32–37. Sternum VIII and IX and genitalia of: 32, *Stivalius afer* (Rothschild) (holotype). 33. *S. parilis* sp. n. (allotype). 34. *S. timanus* Jordan (allotype). 35. *S. nigeriensis* Jordan (holotype). 36. *S. sellatus* Jordan & Rothschild (holotype). 37. *S. pirloti* sp. n. (allotype).

(Text-fig. 34). Anal stylet four or five times as long as wide, with the usual long apical seta but only one preapical minute seta. Bulga of spermatheca (Text-fig. 34) short, very thick-walled, posteriorly with a very prominent hump. The sclerite on each side of the bursa copulatrix is small and somewhat constricted in its middle; it is as long as the small bursa copulatrix (Text-fig. 34). The ductus spermathecae very long, but the dilated portion of the duct (Text-fig. 34) of moderate length, not unlike that of *S. vancanneyti* but relatively much narrower.

LENGTH. ♂ 3½ mm., ♀ 4–4¼ mm.

Stivalius nigeriensis Jordan, 1938

(Text-figs. 35, 47, 48, 59)

Stivalius afer nigeriensis Jordan, 1938, *Novit. zool.* **41** : 116, fig. 62.

MATERIAL EXAMINED. Female holotype from Lagos, Nigeria, from a bush rat, S. L. M. Counal; one female from Adiopodoumé, Ivory Coast, from *Crocidura* sp., 17.iv.1953, V. Aellen.

DESCRIPTION. HEAD. Essentially as in *S. torvus*, but there are only about 15 small setae bordering the antennal fossa posteriorly.

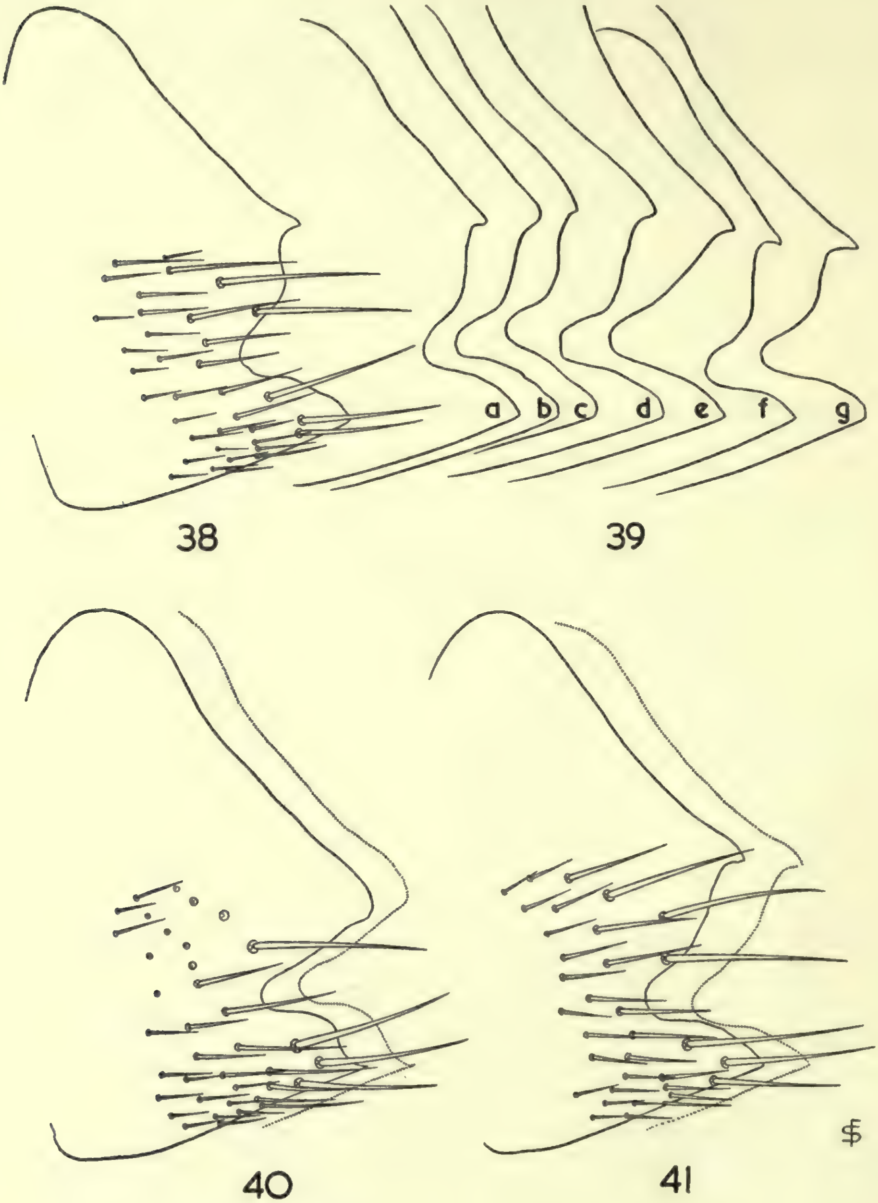
THORAX. Pronotum narrow, dorsally much shorter than the length of the dorsal spines of the pronotal ctenidium, the latter consisting of 20 slightly curved spines. Though narrow, the pronotum still bears two rows of setae (contrast pronotum of *S. alienus*, Text-fig. 1). In other respects the thorax resembles that of *S. torvus*.

LEGS. The tibiae differ from those of all other species of the *torvus*-group by having seven groups of setae in notches of the posterior margin on all the legs, whereas in the other species the fore tibia has seven but the mid and hind tibiae have eight. The numbers of setae in these notches are : mid tibia 2, 2, 2, 2, 3, 2 and 3, hind tibia 2, 2, 1, 2, 2 (or 3), 3, and 3 (the hind tibia closely resembles that of *S. alienus* (Text-fig. 3)).

ABDOMEN. Unmodified abdominal segments as in *S. torvus*, but the upper antesensilial seta is a little less than half the length of the lower.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. FEMALE (Text-figs. 35, 47, 48, 59). Sternum VII (Text-figs. 47, 48) of the type usual in the *torvus*-group, the lobe above the sinus only weakly developed. Variation in outline of the posterior margin of sternum VII as shown in Text-figs. 47, 48. Tergum VIII with four to seven small setae in front of the vertical part of the spiracular fossa ; noselike projection of the posterior margin of tergum VIII nearly absent, indicated by a weak convexity of the margin (Text-fig. 59). Sternum VIII as in Text-fig. 35. Anal stylet about four times as long as its maximum width, with one or two minute preapical setae and a long apical seta. Bulga of spermatheca (Text-fig. 35) with a convex dorsal margin but without a hump. The sclerite on each side of the bursa copulatrix is small and elongate, kidney-shaped, and as long as the bursa ; dilated part of ductus spermathecae rather long and straight (Text-fig. 35).

LENGTH. ♀ 2¾–3 mm.



FIGS. 38, 39. *Stivalius torvus* (Rothschild). 38. Sternum VII of female (Tengeru, Tanganyika). 39. Outlines of sternum VII of females (*a*—Kenya, *b*—Keruguya, Kenya, *c*—Kenya, *d*—Lubero, Kivu district, Belgian Congo, *e*—Kanungu, Kigezi, Uganda, *f*—Machakos, Kenya, *g*—Damba Island, Lake Victoria). Figs. 40, 41. Sternum VII of left hand side and outline (stippled) of right hand side of same sternum. 40. *S. curtiductus* sp. n. (holotype). 41. *S. richardi* Jordan (allotype).

REMARKS. Jordan described *S. nigeriensis* as a subspecies of *S. afer* but remarked that it may represent a separate species since it agrees neither with *torvus* nor with *afer*; he placed it provisionally as a subspecies of *afer* because the sclerite on each side of the bursa copulatrix is more like that of *afer* than that of *torvus*. But the considerable differences in the pronotum, pronotal ctenidium and tibiae between *S. afer* and *S. nigeriensis* show that the latter is better placed as a separate species.

Stivalius fallaciosus sp. n.

(Text-figs. 11, 22)

" *Pygiopsylla torvus* " Jordan & Rothschild, 1911, *Novit. zool.* **18** : 71 ; Jordan & Rothschild, 1922, *Ectoparasites*, **1** : 252.

TYPE MATERIAL. Male holotype from Bamenda, Cameroons, S.E. Nigeria, vi.1909, leg. Adametz, without host-record. The holotype, formerly in the collection of the Zoologisches Museum der Humboldt-Universität in Berlin, has been generously presented by Prof. Dr. F. Peus to the British Museum collection of fleas at Tring.

DIAGNOSIS. The male of this new species can be distinguished from that of related species by the fact that the dense group of thin setae along the ventral margin of the movable process of the clasper extends along the rounded angle of the margin, by the shape of the expanded apical part of the distal arm of sternum IX and by the structure of the aedeagus. Female unknown.

DESCRIPTION. HEAD. Submarginal frontal row consisting of seven setae each side ; in other respects the head resembles that of *S. torvus*.

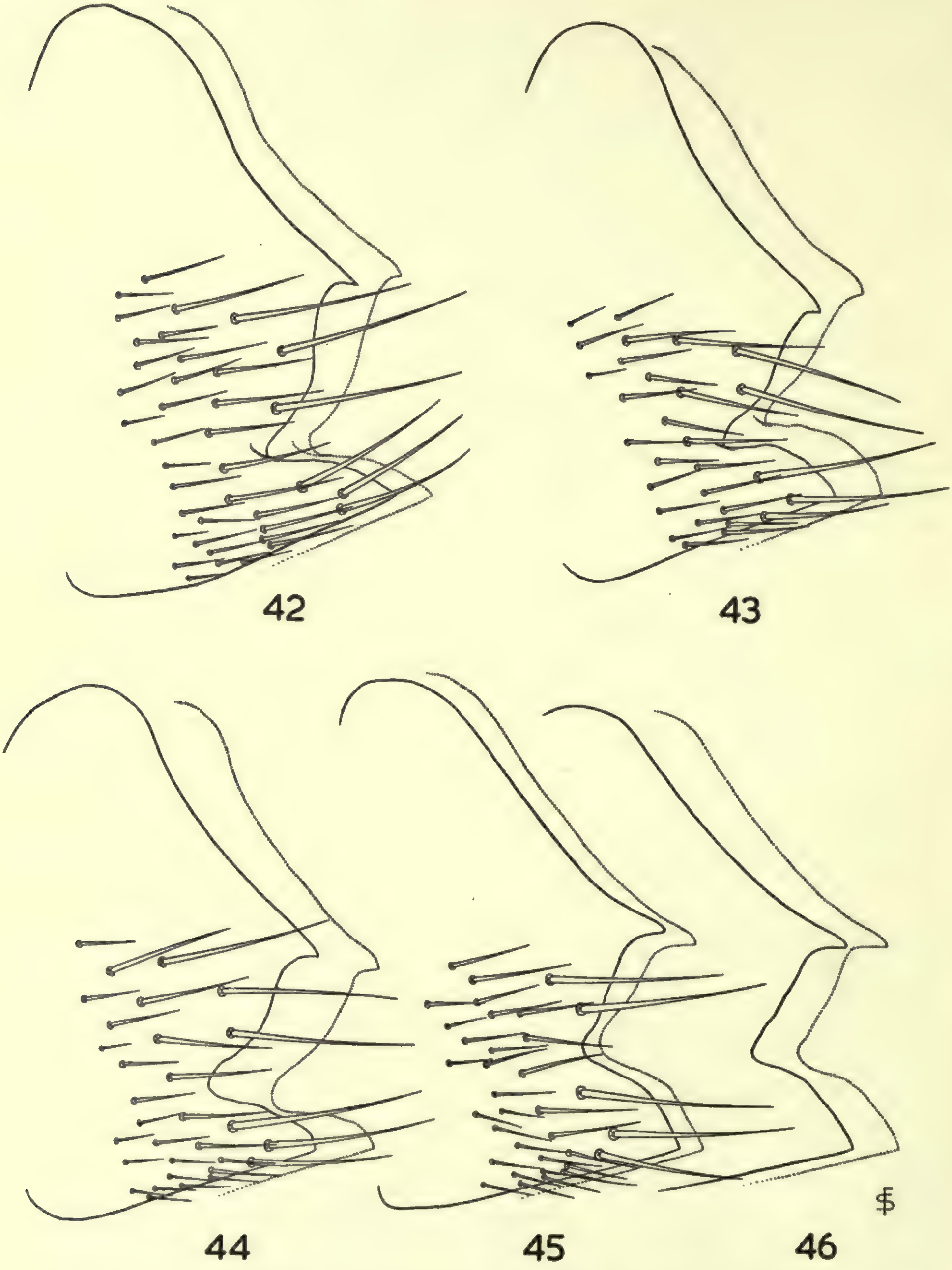
THORAX. Pronotal ctenidium consisting of 23 spines. The two dorsal pseudosetae on each side under the collar of the mesonotum are clearly separated by a gap (as in *S. timanus*).

LEGS. Mid tibia with seven notches in the posterior margin, bearing 2, 2, 1, 2, 3, 2 (or 3) and 3 setae respectively. Otherwise the thorax and legs are essentially as in *S. torvus*.

ABDOMEN. Basal abdominal sternum with one or two small setae anterodorsally ; sterna III–VII with a main row of four setae each side. In other respects the unmodified abdominal segments agree with those of *S. torvus*.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. MALE (Text-figs. 11, 22). Tergum VIII with eight setae each side in front of the vertical portion of the spiracular fossa. Sternum VIII with about 40 setae each side and the usual apical ventro-marginal group of several short setae. Apodeme of tergum IX as in *S. torvus* ; manubrium broad ; fixed process of clasper with one long and one short acetabular seta ; movable process short for this group, the four or five long seta at the ventral margin of the bent-down apical portion are placed rather close together (Text-fig. 11). The apex of the distal arm of sternum IX with a characteristic widening, the dorsal projection rather long and its apex splayed out ; the ventral spiniform setae form a dense group (Text-fig. 11). Aedeagus as in Text-fig. 22 ; the tendons of the phallosome make about two convolutions.

LENGTH. ♂ 3¼ mm.



FIGS. 42–46. Sternum VII of left hand side and outline (stippled) of right hand side of same sternum. 42. *Stivalius vancanneyti* Berteaux (holotype). 43. *S. afer* (Rothschild) (holotype). 44. *S. parilis* sp. n. (paratype). 45, 46. *S. timanus* Jordan (45—allotype, 46—paratype).

Stivalius sellatus Jordan & Rothschild, 1923

(Text-figs. 14, 20, 36, 49, 60)

Stivalius sellatus Jordan & Rothschild, 1923, *Ectoparasites*, **1** : 304, fig. 301 ; Hopkins, 1947, *Uganda J.* (Suppl.) **11** : 155.

MATERIAL EXAMINED. Female holotype from Bubungi, North Bugishu, Eastern Uganda, 28.i.1922, from a rat, W. N. van Someren ; one male from Torit, Equatoria, Sudan, 3,800 ft., from a mouse, 7.iv.1950, H. Hoogstraal, presented by Lt.-Col. R. Traub.

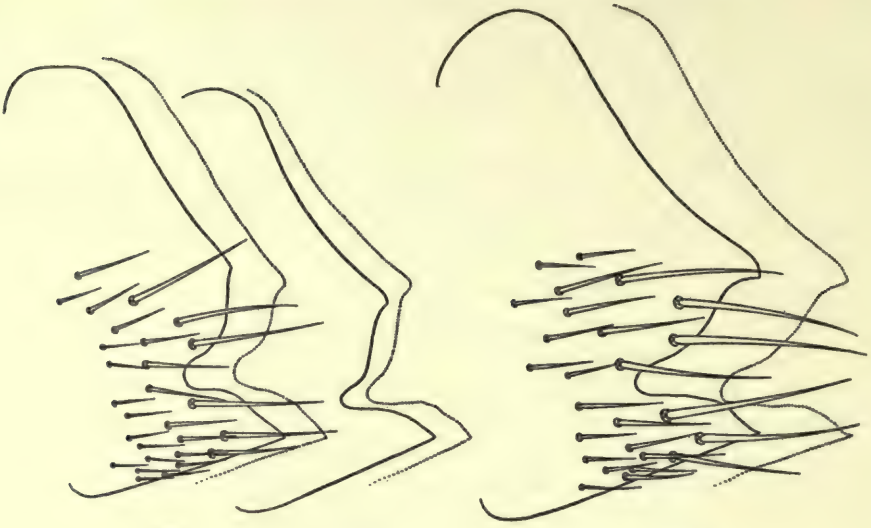
DESCRIPTION. HEAD. Essentially as that of *S. torvus*, but the frons is somewhat more strongly rounded, and the small setae bordering the antennal fossa are less numerous.

THORAX. Like that of *S. torvus* ; the pronotal ctenidium with 24 spines in both the available specimens.

LEGS. The outer side of the fore tibia with only three to five lateral setae in the male, six or seven in the female. In both the specimens examined one hind tibia has the usual eight groups of setae in notches along the posterior (dorsal) margin, but on the other side there are nine, an extra single stout seta being present between the second and third notches (counting from the base).

ABDOMEN. Marginal spinelets of terga II–IV developed into moderately large spines which form dorsal ctenidia consisting of six spines each side on all three terga in the male, while in the female there are six and seven on the two sides of terga II and III and six on each side of tergum IV ; no spines or spinelets on other terga. Dorsally the ctenidia of each side do not quite meet, but are separated by a short dorsal interspace. Basal abdominal sternum with only one lateral seta in the only male examined, but about 25 in the female holotype. In other respects the chaetotaxy of the unmodified abdominal segments resembles that of *S. torvus*.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. MALE (Text-figs. 14, 20). Tergum VIII anterior to the vertical part of the spiracular fossa with three short setae on one side and four on the other. Sternum VIII with about 25 setae each side and a ventro-marginal group of two stout and three small setae. Apodeme of tergum IX (Text-fig. 14) narrow and of the same construction as in other species of the *torvus*-group. Manubrium much narrower than the width of the basal half of the aedeagal apodeme, rather short, its ventral margin wholly convex. Fixed process of clasper with one very long and slender and one very short acetabular seta. The down-bent apical portion of the movable process bears ventrally two or three long setae and forms about a right angle with the long and straight part of the process, the usual dense patch of thin setae along the ventral margin before the bend is very narrow (Text-fig. 14). Dorsal margin of the widened apical part of the distal arm of sternum IX (Text-fig. 14) smoothly convex, without irregularities in its outline ; a group of short setae, several of which are stout but none definitely spiniform, is present at the ventro-apical angle of the apex ; the dorso-apical angle is sharp. Aedeagus as in Text-fig. 20 ; the tendons of the phallosome form about two convolutions ; aedeagal apodeme with the deep concavity in the dorso-apical half which is characteristic of the *torvus*-group.



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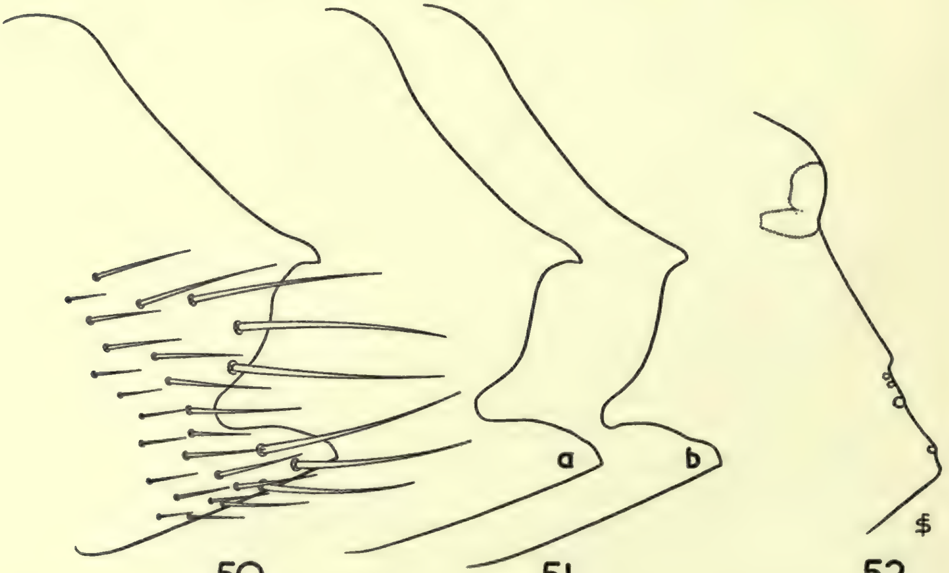

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FIGS. 47–49. Sternum VII of left hand side and outline (stippled) of right hand side of same sternum. 47, 48. *Stivalius nigeriensis* Jordan (47—holotype, 48—Adiopodoumé, Ivory Coast). 49. *S. sellatus* Jordan & Rothschild (holotype). Figs. 50–52. *S. pirloti* sp. n. 50. Sternum VII of female (allotype). 51. Outlines of sternum VII of two paratypes (nr. Elisabethville) 52. Outline of tergum VIII of female (allotype).

FEMALE (Text-figs. 36, 49, 60). Sternum VII (Text-fig. 49) with a deep sinus of the usual shape dividing the main row of four setae into two groups of two ; chaetotaxy of this sternum as shown in the figure. Tergum VIII with eight or nine setae in front of the vertical part of the spiracular fossa ; noselike projection of the posterior margin of this tergum rather weakly developed (Text-fig. 60). Sternum VIII as in Text-fig. 36. Anal stylet just over thrice as long as its maximum width, with a long apical seta and two minute preapical setae. Bulga of spermatheca (Text-fig. 36) with a fairly thick wall and a small dorsal hump. The sclerite each side of the extremely small bursa copulatrix is poorly sclerotised and small. The dilated part of the ductus spermathecae is not very long, in contrast with the remainder of this duct (Text-fig. 36).

LENGTH. ♂ 3 mm., ♀ 3 mm.

Stivalius pirloti sp. n.

(Text-figs. 15, 23, 27, 37, 50–52)

TYPE MATERIAL. From the neighbourhood of Elisabethville, Katanga, Belgian Congo, collected by Dr. P. L. Pirlot : male holotype, nine male and three female paratypes from *Rattus* (*Praomys*) *morio jacksoni*, 1957 ; female allotype from Kikusue near Elisabethville, from *Rattus* (*Praomys*) *morio jacksoni*, vi.1956, collected by M. Lips ; one female paratype from Kanienge near Elisabethville, from *Rattus* (*Praomys*) *morio jacksoni*, vi.1956, M. Lips. Holotype, allotype and several paratypes in the Musée Royal du Congo Belge, Tervuren.

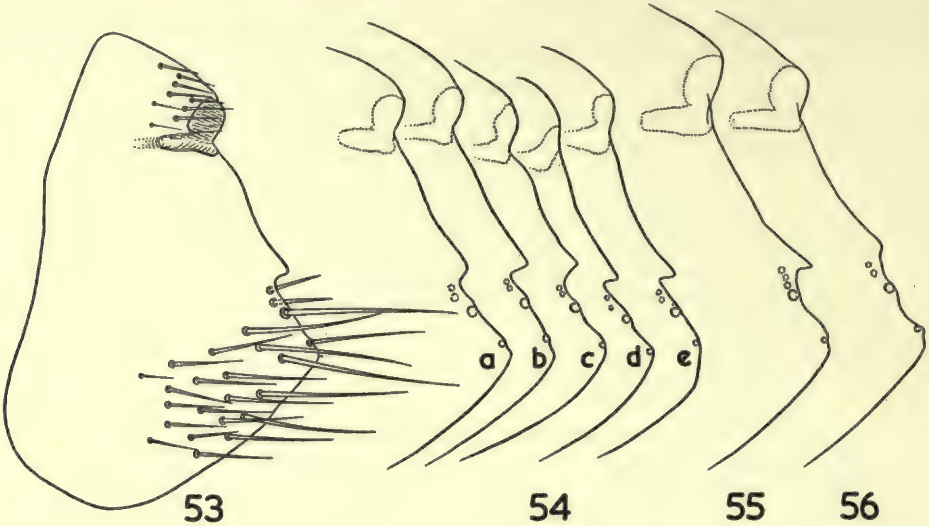
DIAGNOSIS. Separable from all other African members of the genus, except *S. sellatus*, by the possession of dorsal ctenidia on some of the abdominal terga; from *S. sellatus* in the male by the possession of (*a*) a large area of thin setae on the inner side of the movable process, (*b*) only one acetabular seta (there are two such setae in all other African species), (*c*) a number of shortish spiniform setae on the ventro-apical margin of sternum IX, (*d*) sickle-shaped dorso-apical aedeagal sclerite; in the female by the presence of large, curved and rather narrow sclerites associated with the bursa copulatrix.

DESCRIPTION. HEAD. As in *S. torvus*.

THORAX. Pronotal ctenidium with 24–27 (normally 24) slender spines in the male, 25–26 in the female. Metanotum with a main row of seven setae on each side. In other respects the thorax, as well as the legs, resemble those of *S. torvus*.

ABDOMEN. All the marginal spinelets developed into spines, which form conspicuous dorsal ctenidia on terga II–IV (Text-fig. 27) and sometimes also on V ; on tergum I there are usually no spines (occasionally one, or one on each side), on tergum II four or five on each side, on tergum III four (sometimes five), on tergum IV three or four in the male and two to four (generally three) in the female, and on tergum V one (sometimes two) in the male and one or none in the female. Basal abdominal sternum with a lateral patch of one to eight (average four) small setae in the male and 12–20 (average 17) in the female. Otherwise the unmodified abdominal segments are like those in *S. torvus*.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA. MALE (Text-figs. 15, 23). Tergum VIII with three to six smallish setae each side anterior to the vertical portion



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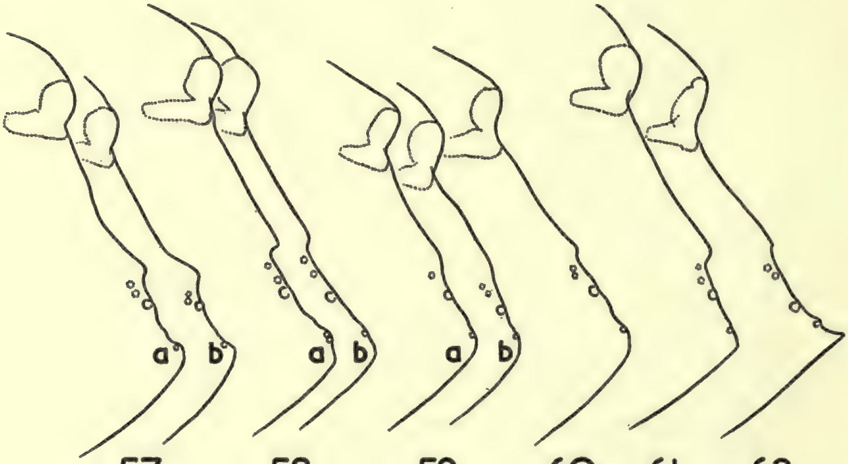

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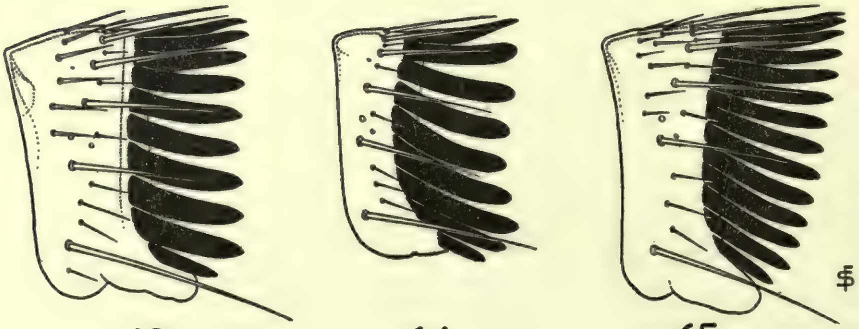

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of the spiracular fossa. Sternum VIII with 25–30 setae each side, the three most apical of the ventral setae are set closely together. Apodeme of tergum IX and manubrium (Text-fig. 15) more or less as in *S. torvus*. Fixed process of clasper with one long acetabular seta only. Movable process of clasper like that of *S. torvus*, but relatively longer, the down-bent apical portion forming an angle far greater than a right angle with the basal portion (contrast *S. sellatus*, Text-fig. 14). Sternum IX (Text-fig. 15) not unlike that of *S. torvus*, but the apical part of the distal arm is little widened, proportionally longer and the spiniform setae along the ventro-apical margin are much blunter and more widely spaced. Aedeagus as in Text-fig. 23; dorso-apical aedeagal sclerite sickle-shaped; tendons of phallosome making about two convolutions; dorsal margin of aedeagal apodeme strongly concave preapically.

FEMALE (Text-figs. 37, 50–52). Sternum VII (Text-figs. 50, 51) of the shape usual for the *torvus*-group and with a chaetotaxy resembling that of the other species in this group. Tergum VIII with a row of five setae in front of the vertical portion of the spiracular fossa; chaetotaxy of the ventral part of this tergum as in other species of the group; posterior margin of tergum VIII as in Text-fig. 52. Anal segment more or less as in *S. torvus*. Bulga of spermatheca thick-walled, with only a small dorsal hump, hilla with a papilla (Text-fig. 37). The pair of dark sclerites associated with the bursa copulatrix long and slender and markedly curved; the dilated part of the ductus spermathecae is long, not very wide, and internally provided with the usual membranous rings (Text-fig. 37).

LENGTH. ♂ 3–3½ mm., ♀ 3½–4¼ mm.

REMARKS. I have pleasure in naming this new flea, a parasite of the arboreal *Rattus* (*Praomys*) *morio*, after Dr. P. L. Pirlot, who made extensive collections of fleas while studying and collecting mammals in the Belgian Congo.

Stivalius cacuminis sp. n.

(Text-figs. 12, 24)

TYPE MATERIAL. Male holotype collected on the top of Mt. Soque (about 40–50 miles east of Lobito), Angola, from a mouse,[1] on 27.viii.1954, by G. Heinrich. The holotype is in the Chicago Natural History Museum.

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[1] Dr. R. L. Wenzel, of the Chicago Natural History Museum, kindly informed me that the following rodents were collected by Mr. Heinrich on Mt. Soque on August 27, 1954: *Graphiurus* sp., *Otomys irroratus*, *Dendromus* sp., *Lophuromys sikapusi*, *Oenomys* sp., *Pelomys fallax* and *Rattus* (*Praomys*) *namaquensis*. Since *Stivalius cacuminis* is closely related to *S. pirloti* (a parasite of *Rattus* (*Praomys*) *morio*) it is possible that *Rattus* (*Praomys*) *namaquensis* is the true host of *S. cacuminis*.

FIGS. 53, 54. *Stivalius torvus* (Rothschild). 53. Tergum VIII of female (Keruguya, Kenya). 54. Outlines of tergum VIII of females (*a–c*: Keruguya, Kenya, *d–e*: Machakos, Kenya). Figs. 55–62. Outlines of tergum VIII of females of: 55. *S. vancanneyti* Berteaux (holotype). 56. *S. afer* (Rothschild) (holotype). 57. *S. parilis* sp. n. (*a*—paratype, *b*—allotype). 58. *S. timanus* Jordan (*a*—allotype, *b*—paratype). 59. *S. nigeriensis* Jordan (*a*—holotype, *b*—Adiopodoumé, Ivory Coast). 60. *S. sellatus* Jordan & Rothschild (holotype). 61. *S. richardi* Jordan (allotype). 62. *S. curtiductus* sp. n. (holotype). Figs. 63–65. Pronotum of females of: 63. *S. aestivalis* Jameson & Sakaguti (Hanase, Kyoto Prefecture, Honshu, Japan). 64. *S. ferinus* (Rothschild) (Namunukula, Ceylon). 65. *S. insolli* Traub (Brinchong Hill, Cameron Highlands, Malaya).

Diagnosis. On the structure of the aedeagus this new species is nearest related to *S. pirloti*, from which it can be distinguished at once by the absence of ctenidia on the anterior abdominal terga.

Description. Head, thorax, legs and unmodified abdominal segments as in *S. torvus*.

Modified abdominal segments and genitalia. Male (Text-figs. 12, 24). Segment VIII as in *S. torvus*, except for the apical subventral group of setae on sternum VIII which consists of only three setae with four very small setae opposite these, on the inner side of the sternum. Apodeme of tergum IX, manubrium and fixed process of clasper (Text-fig. 12) similar to those in *S. torvus*; movable process much longer than that of *S. torvus*, with a relatively narrow patch of thin setae subventrally on the inner side of the long straight portion; the ventral margin of the apical bent-down portion with four long setae (Text-fig. 12). Sternum IX (Text-fig. 12) resembling that of *S. pirloti*, differing in some small details. Aedeagus as in Text-fig. 24; the tendons of the phallosome make nearly two convolutions; dorso-apical aedeagal sclerite sickle-shaped; the dorsal margin of the aedeagal apodeme is strongly concave before the tip.

Length. ♂ 3½ mm.

Key to the African Species of *Stivalius*

1. Genal margin below eye divided into two partly overlapping lobes (Text-fig. 1); ♂—tendons of phallosome short, hardly reaching beyond apex of aedeagal apodeme (Text-fig. 16); dorsal margin of aedeagal apodeme almost straight (Text-fig. 16); ♀—no paired sclerotic structure alongside the bursa copulatrix (Text-fig. 25); dilated part of ductus spermathecae slender, with a number of thick sclerotic internal rings (Text-fig. 25) (*ferinus*-group) . . . . *alienus*, p. 42

– Genal margin below eye entire (Text-fig. 2); ♂—tendons of phallosome making at least half a convolution (Text-figs. 17, 18); dorsal margin of aedeagal apodeme strongly concave preapically (Text-figs. 17, 18); ♀—bursa copulatrix in most species with a dark sclerotic structure on each side (Text-fig. 26, 28–37); dilated part of ductus spermathecae with a large number of membranous internal divisional rings (Text-figs. 26, 28–37) (*torvus*-group) 2

2. Terga II–IV with developed dorsal ctenidia (Text-fig. 27) 3

– These terga with only one subdorsal marginal spinelet 4

3. ♂—Apical portion of movable process bent downwards at about a right angle; along the ventral margin before the bend a relatively sparse group of thin setae; fixed process of clasper with two acetabular setae (Text-fig. 14); ♀—Bursa copulatrix very small, the sclerites not much darkened (Text-fig. 36) *sellatus*, p. 69

– ♂—Down-bent apical portion of movable process forming an angle considerably greater than a right angle with the basal portion, the latter part bearing a large area of thin setae on inner side; fixed process with only one acetabular seta (Text-fig. 15); ♀—Bursa copulatrix fairly large, the curved sclerites very long and narrow (Text-fig. 37) . . . . *pirloti*, p. 71

4. Dorsal (posterior) margin of hind tibia with seven groups of setae in notches; pronotum dorsally much shorter than dorsal pronotal spines; pronotal ctenidium

with 20 spines (male unknown) . . . . . . *nigeriensis*, p. 65

– Dorsal margin of hind tibia with eight groups of setae ; normally at least 22 pronotal spines which are usually about as long as (or a little shorter than) pronotum . 5

5. Males (this sex not known of *afer*, *curtiductus* and *vancanneyti*) 6

– Females (this sex not known of *fallaciosus* and *cacuminis*) 11

6. Tendons of phallosome making at most half a convolution ; apex of aedeagal apodeme without a tendril (Text-fig. 17) 7

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8. Upper extension of dorso-apical aedeagal sclerite sickle-shaped (Text-fig. 24) ; ventral margin of basal part of movable process with a narrow group of thin setae (Text-fig. 12) . . . . *cacuminis*, p. 73

– Upper extension of dorso-apical aedeagal sclerite not sickle-shaped ; area of thin setae along ventral margin of movable process much wider 9

9. Ventro-marginal group of setae on movable process extending along curvature of margin to the first large ventral seta of down-bent portion ; apex of widened part of distal arm of sternum IX splayed out (Text-fig. 11) . . *fallaciosus*, p. 67

— The group of thin setae on movable process not extending along curvature of margin ; apex of widened part of distal arm of sternum IX not splayed out . . . 10

10. Proximal arm of sternum IX subequal in length to distal arm ; dorso-apical angle of club-shaped expansion of latter arm broadly rounded (Text-fig. 10) ; ventro-apical angle of lower lateral aedeagal lobe of about 90° ; dorsal wall of aedeagal inner tube relatively thin (Text-fig. 18) . . . . . . *timanus*, p. 63

— Proximal arm of sternum IX distinctly longer than distal arm ; apex of latter arm not much widened (Text-fig. 9) ; apical and ventral margins of lower lateral aedeagal lobe forming a very acute angle ; dorsal wall of inner tube very thick (Text-fig. 19) *parilis*, p. 61

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— Dilated part of ductus spermathecae relatively long and narrow (Text-figs. 31–37) 14

12. Only a vestige left of the sclerites associated with the bursa copulatrix ; undilated part of ductus spermathecae very short (Text-fig. 29) . . *curtiductus*, p. 55

— Sclerites associated with bursa copulatrix well developed ; undilated part of ductus spermathecae much longer (Text-figs. 26, 28, 30) 13

13. Sclerites of bursa copulatrix fairly small and roughly triangular (Text-figs, 26, 28) *torvus*, p. 47

— These sclerites very large and shaped like the sole of a shoe (Text-fig. 30) *richardi*, p. 53

14. Sclerites about as long as bursa copulatrix (Text-figs. 33, 34) 15

— Sclerites about twice as long as bursa copulatrix (Text-figs. 31, 32) 16

15. Sclerites and bursa copulatrix relatively large, nearly as long as bulga of spermatheca (Text-fig. 33) . . . . *parilis*, p. 61

— Sclerite and bursa copulatrix much smaller in relation to length of bulga (Text-fig. 34) . . . . *timanus*, p. 63

16. Dilated part of ductus spermathecae about seven times as long as wide (Text-fig. 31) *vancanneyti*, p. 57

— Dilated part of ductus spermathecae about twelve times as long as wide (Text-fig. 32) . . . . *afer*, p. 59

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THE PSEUDOCOCCIDAE (HOM. : COCCOIDEA) DESCRIBED BY C. K. BRAIN FROM SOUTH AFRICA

G. DE LOTTO

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THE BRITISH MUSEUM (NATURAL HISTORY)
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BY

G. DE LOTTO xnf.
Department of Agriculture, Kenya

Pp. 77–120 ; 19 *Text-figures*

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THE PSEUDOCOCCIDAE (HOM.: COCCOIDEA) DESCRIBED BY C. K. BRAIN FROM SOUTH AFRICA

By G. DE LOTTO

Department of Agriculture, Kenya

Our knowledge in the Pseudococcid fauna of South Africa is almost entirely based on the works published by C. K. Brain, who treated altogether forty-two species and varieties, thirty-one of which were described by him as new. Omitting any criticism of the methods he used in all his descriptions, which are more or less of the standard then attained by the majority of entomologists, it is evident that none of his species can be recognized without the examination of the types. Subsequent workers dealt with a few of his species, but those remaining were still completely unrecognizable.

In the present paper all Brain's species are reviewed or redescribed from the types, paratypes or specimens which, although marked by the serial number only, undoubtedly belonged to the original material studied by him. The main work was carried out at the Division of Entomology of the Department of Agriculture in Pretoria, where the bulk of Brain's collection is deposited. Material of four species apparently missing there, was made available from the U.S. National Collection of Coccidae in Washington, D.C.

With a few exceptions the original material examined was in poor and at times in very poor condition. Specimens were often broken and badly distorted and not cleaned or not properly cleaned of the body content. Furthermore some specimens were evidently mounted from dry material or overboiled when treated with KOH, so that when remounting we found very serious difficulties on making really adequate microscope preparations. The utmost care was made in studying every structure of taxonomic value in order to present adequate diagnoses and figures so as to enable the recognition of the various species and serve for their generic allocation in the final revision.

Out of twenty-nine species and two varieties described as new by Brain, three species and one variety have been already synonymized by various authors. Four more species and one variety are synonymized in the course of the following pages. The complete list of them is as follows:

Antonina transvaalensis = *natalensis* Brain.
Pseudococcus capensis = *maritimus* (Ehrhorn).

Pseudococcus citri phenacocciformis = *citri* (Risso).
Pseudococcus elisabethae = *quaesitus* Brain.
Pseudococcus natalensis = *graminis* (Maskell).
Pseudococcus segnis tylococciformis = *segnis* Brain.
Pseudococcus solitarius = *vastator* (Maskell).
Pseudococcus trichiliae = *quaesitus* Brain.
Rhizoecus africanus = *falcifer* Kuenckel.

With the publication of this paper nearly two thirds of the described mealy-bugs of the African continent south of Sahara have been dealt with.

Antonina natalensis **Brain**

(Text-fig. 1)

Antonina natalensis Brain, 1915, *Trans. roy Soc. S. Africa.* **5** : 86.
Antonina transvaalensis Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 87 (SYN. NOV.).
Antonina indica panica Hall, 1925, *Bull. Minist. Agric. Egypt.* **64** : 6 (SYN. NOV.).
Antonina indica panica Hall, 1937, *Trans. R. ent. Soc. Lond.* **86** : 125.

One slide with a single very adult female was available from the U.S. National Collection of Coccidae, Washington, D.C. It was labelled : " *Antonina natalensis* Br.; grass ; Pietermaritzburg, Nov. 15, 1914 ; Chas. K. Brain ; 33, C.K.B." The specimen was in fair condition, although the body skin was slightly chitinized and there were difficulties in examining some glandular structures.

" Adult female enclosed in a dense, though, felted sac at the base of grasses. Ovisac : at first sight the ovisacs appear spherical, but on closer inspection they are found to be somewhat produced at the anterior end, so as to be really pear-shaped, 4·5 mm. long and 3·8 to 4 mm. broad. In colour the sac is yellowish-white to buff. Adult female : purplish-black in colour, about 4 mm. long, distinctly semipyriform, being flattened ventrally and broadly rounded behind while the anterior end is narrowed. There is not secretionary covering, but the walls of the sac are closely adherent to the body of insect." (Brain, *l.c.*). Body of mounted specimen broadly oval with posterior end chitinized. Anal and marginal cerarii entirely absent. Anal ring with six robust setae, set at inner extremity of a deep invagination of dermis. Multilocular disc pores numerous on median and submedian areas of venter and a few crowded near each stigmatic opening. Tubular ducts with inner end dome-shaped ; they are fairly abundant and uniformly distributed on either side of body. Sieve-like pores caudad of posterior stigmatic opening lacking, apparently being replaced by flat circular glands with a granulated surface, variable in size and always smaller than multilocular disc pores. Trilocular pores evenly scattered on dorsum and venter. Very small invaginations of ventral dermis mark the position where the legs would be situated. Body setae very short, except a few on posterior end of body. Atrium of each stigmatic opening with a band of trilocular pores. Antennae formed by two or three small joints, with a tuft of short setae on apex.

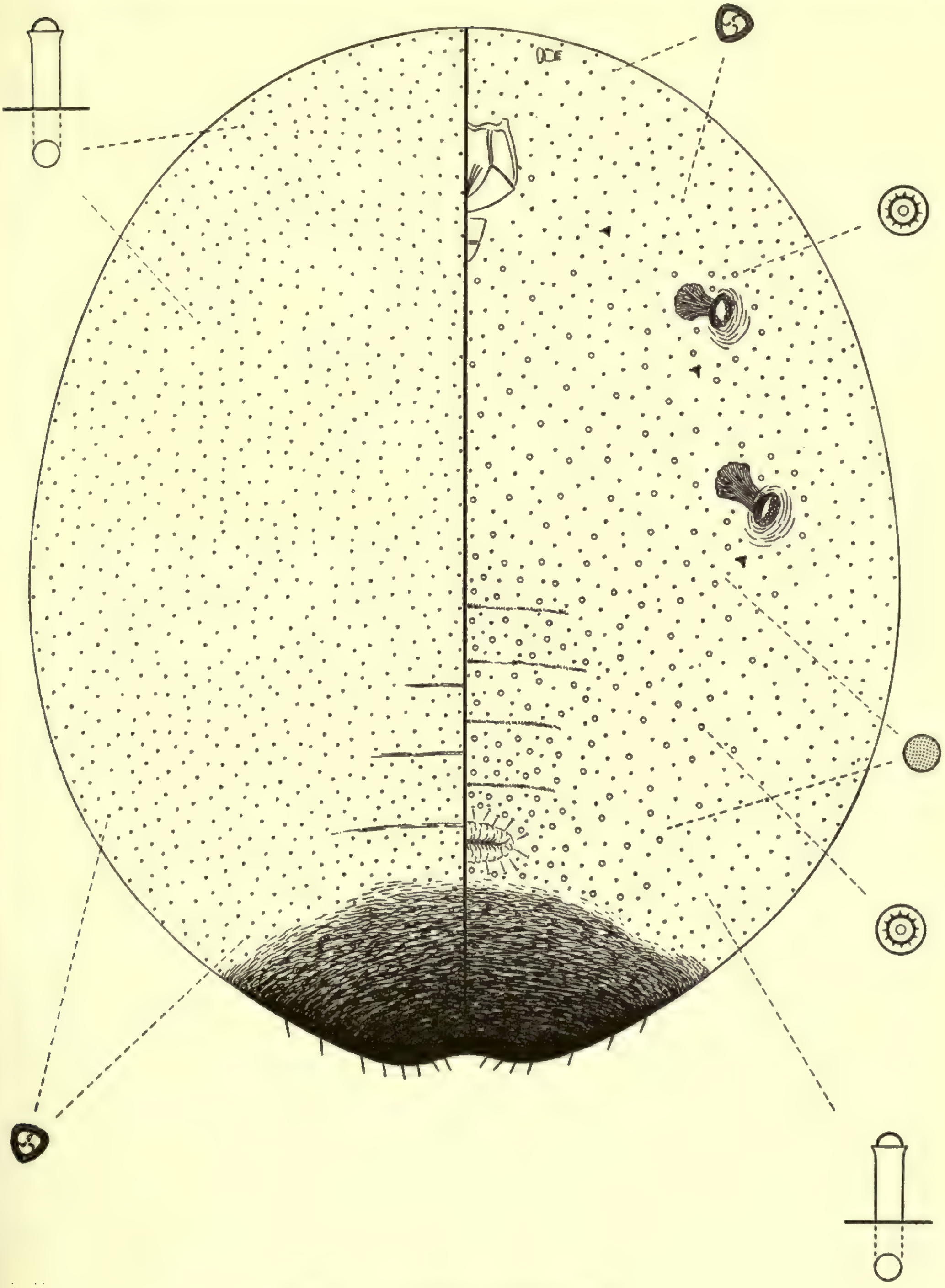

FIG. 1. *Antonina natalensis* Brain

Antonina transvaalensis Brain (= ***Antonina natalensis*** Brain)

Antonina transvaalensis Brain, 1915, *Trans. roy Soc. S. Afr.* **5** : 87.

One slide on loan from the U.S. National Collection of Coccidae, Washington, D.C., was seen. It contained three adult females, the last abdominal segments of another adult female and one larva. It bore the following label: "*Antonina transvaalensis* Brain ; on roots of grass ; Daspoort, Pretoria ; C. K. Brain coll., Oct. 11, 1939; Brain II 70 ; 70, C.K.B." The mistake in the year of collection is evidently due to a pen slip. Very likely this slide, as many others in Brain's collection in Pretoria, was originally marked with the serial number only, and the label was written much later.

Antonina transvaalensis is a synonym of *natalensis* as no structural differences were found between the two species.

Grewiacoccus gregalis Brain

(Text-fig. 2)

Grewiacoccus gregalis Brain, 1918, *Bull. ent. Res.* **9** : 108.

The material examined was represented by five slides each containing a single adult female in fairly good condition, except that the prosoma was partly distorted. All slides were labelled : "*Grewiacoccus gregalis ;* Transvaal, Pienaar's River, 23 January 1917 ; C.K.B. and C. Fuller ; on leaves of kruisbesje[1] ; C.K.B. 305."

" Adult female causing a gall on the leaf of the host-plant, in which one, two or three insects may be present. The galls may be solitary, or, as is often the case, five to twelve may be found clustered around the edge of a single leaf. The mature gall is about 6 mm. in length, broadly inflated, with the sides tapering slightly to the neck, of a scrotal shape or one very much like a pitcher. The galls stand nearly erect from the distorted edge, and are of the same green colour and texture as the leaf. There is no hole at the distal end, but below, on the under-side of the leaf, is a circular opening through which project two dense white filaments accompanied by a small amount of fine white cottony matter. When obtained in January numerous young were found clustered around the necks of some of the galls. All the available space in the gall is occupied by the female—or females if these are two or three—and on the inner walls there is a slight layer of white wax, which is more plentiful near the base, or where the posterior part of the insect is. . . . Adult female when alive, yellowish or slight pink, about 3·2 mm. long." (Brain, *l.c.*). Mounted specimens broadly oboval, tapering posteriorly with dorsal dermis of postsoma very slightly chitinized at maturity. Anal and marginal cerarii absent. Anal lobes each provided on ventral side with a short stout seta. Multilocular disc pores absent. Tubular ducts very short with chitinized walls ; inner end membranous, dome-shaped. They occur on both sides of body and are more numerous on last abdominal segments. Trilocular pores distributed on either side of body ; a few crowded near each stigmatic opening. Circular disc pores lacking. Posterior dorsal ostioles rather prominent, with lips

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[1] Afrikaans name of *Grewia occidentalis* L.

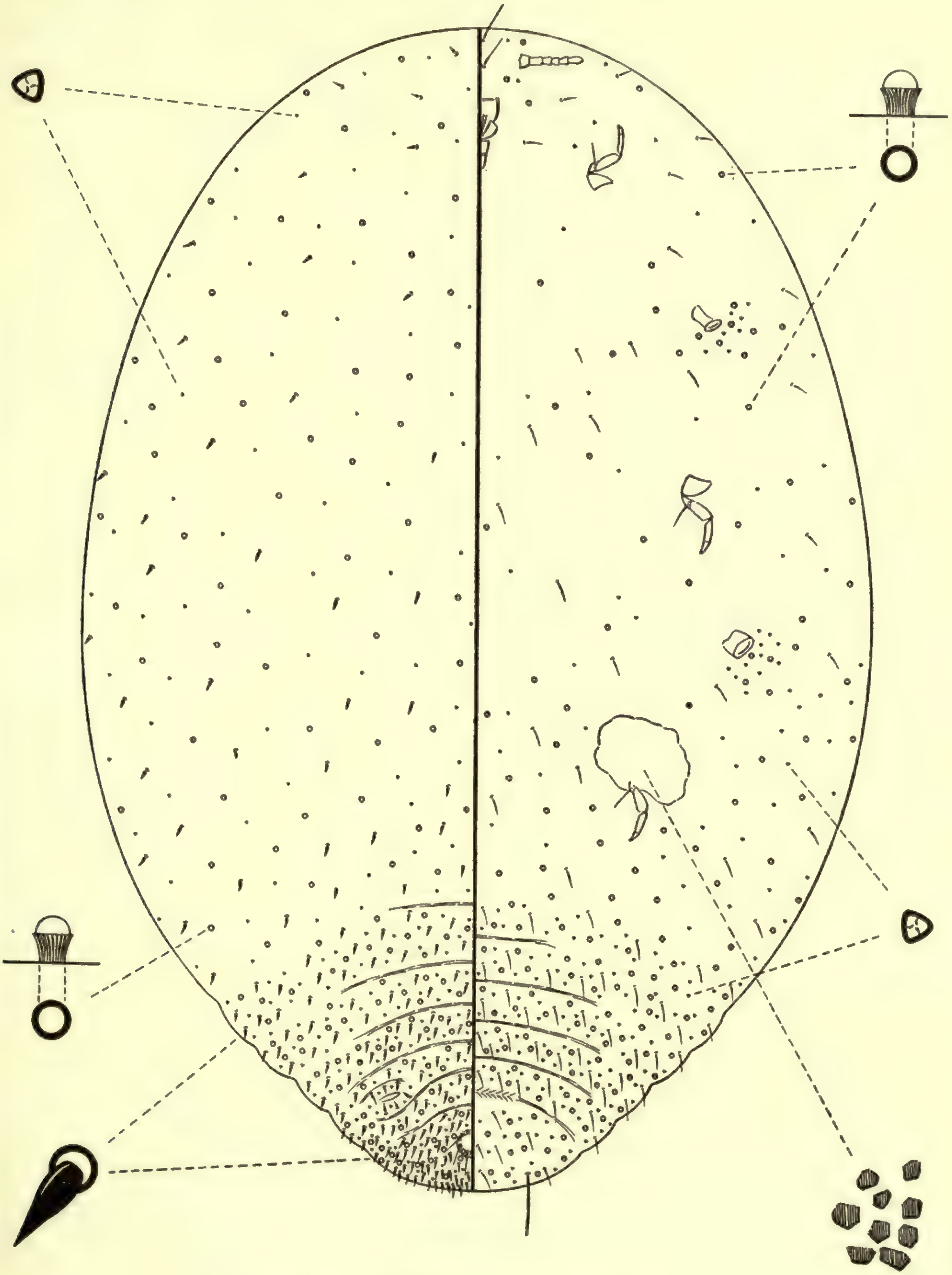

FIG. 2. *Grewiacoccus gregalis* Brain

membranous ; anterior ones not recognizable. Circulus absent. Legs small ; hind coxae broadly enlarged forming an irregularly shaped plate marked by numerous small and slightly chitinized areas. Numerous short stoutly lanceolate setae arranged dorsally all around anal ring ; on preceding segments they tend to be fewer and smaller ; on prosoma they are still more widely scattered. Ventral setae small and slender, not numerous. Antennae with six joints. Anal ring entire, with six small setae.

Natalensis fulleri Brain

(Text-fig. 3)

Natalensis fulleri Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 91.

Four slides were available, two with larvae and two containing a single specimen in very poor condition ; both being very old adults, partly broken, distorted and attacked by fungi. All slides were marked : " 43, C.K.B." which is the serial number of Brain's collection. The material was originally " collected on the roots of grass in the nests of a small red ant in the Botanic Gardens, Pietermaritzburg, Natal by Mr. Claude Fuller, 1910." (Brain, *l.c.*).

" Adult female entirely enclosed in a double-walled cyst. Cyst : outer cyst may attain 9 mm. long by 5 mm. broad, dark-coloured owing to adherent soil ; brittle when dry . . . Inner cyst pale buff-coloured. This has the appearance of being more loosely constructed. The outer shape and size are those of the interior of the outer cyst, from which it separates readily . . . Adult female (from dry material), after boiling in KOH dark brown in colour, broadly elliptical, 4 mm. long and 4·5 mm. broad, convex above and flat beneath." (Brain, *l.c.*). Body of mounted specimens very broadly elliptical with dermis slightly chitinized at full maturity. Cerarii recognizable only on anal lobes, each being built up by two short and stout setae surrounded by a few trilocular pores. Area about setae not chitinized. Ventral side of each anal lobe without apical seta. Multilocular disc pores, tubular ducts, tritubular ducts and circular disc pores absent. Trilocular pores few and widely scattered on both side of body. Anterior and posterior dorsal ostioles, circulus and ventral cephalic plate absent. Anal ring entire, with six setae. Antennae with six joints, devoid of any falcate sensory seta. Legs very small with tarsal digitules finely pointed ; ungual ones slightly knobbed at apex. Body setae few, slender and widely distributed on either side.

Pseudococcus bantu Brain

(Text-fig. 4)

Pseudococcus bantu Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 137.

Four slides each with a single adult female in fairly good condition were seen. They bore the following label : " *Phenacoccus bantu* Brain ; grass ; P.m. burg, N.[1] : Nov. 1914 ; paratype ; Char. K. Brain ; 34, C.K.B." Another slide contained ova and larvae only.

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[1] Abbreviation for Pietermaritzburg, Natal.

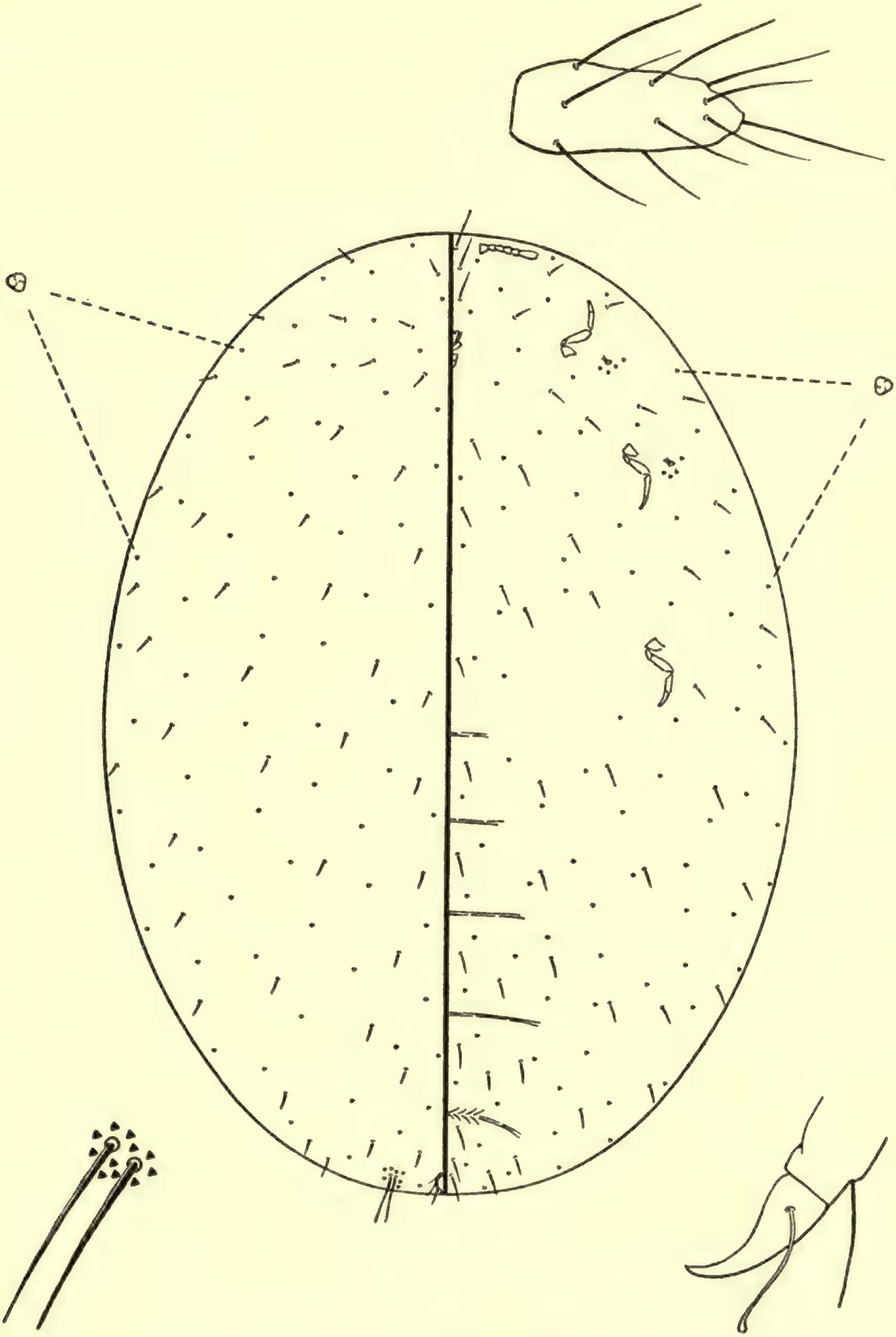

Fig. 3. *Natalensis fulleri* Brain

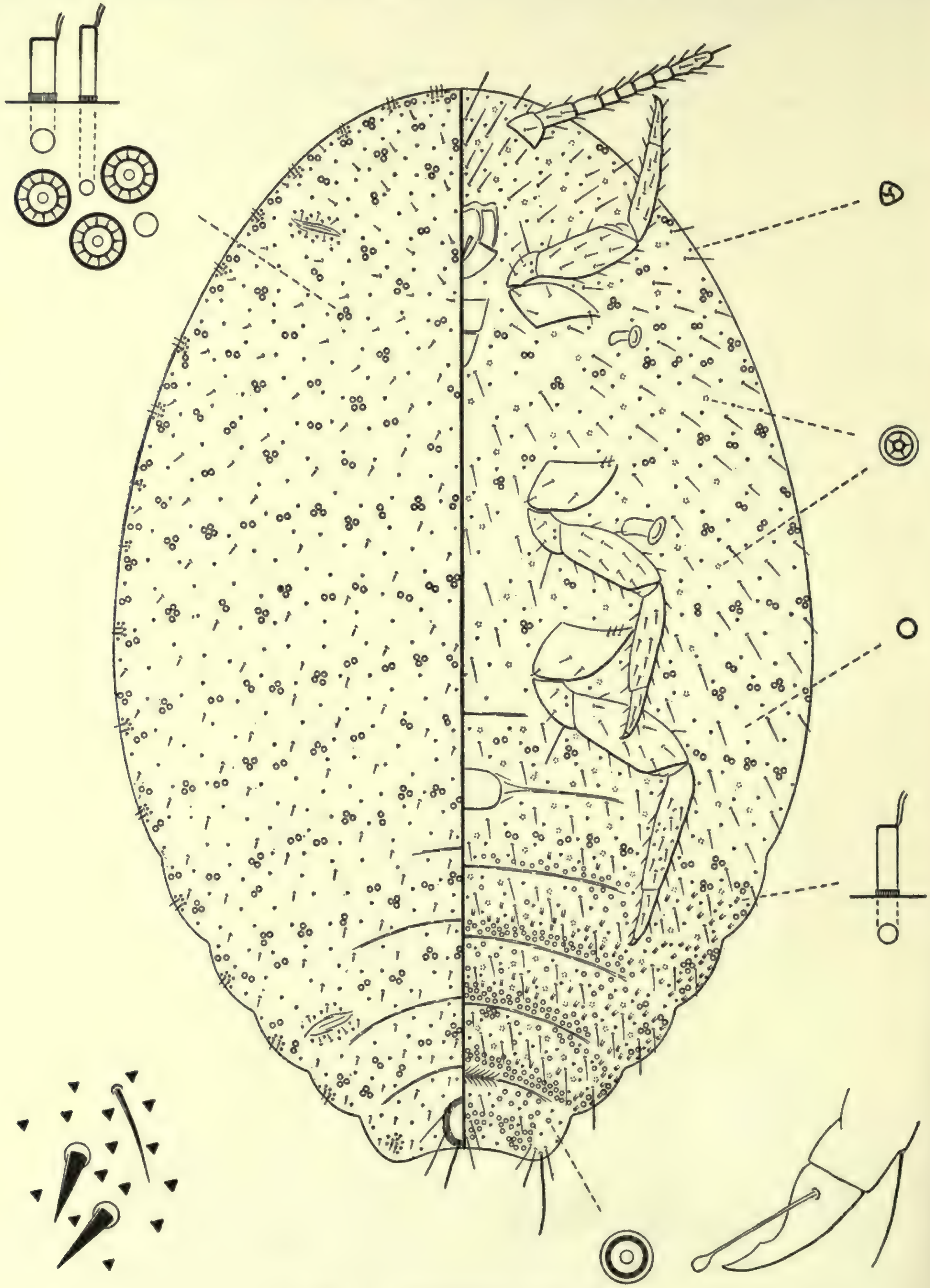

FIG. 4. *Pseudococcus bantu* Brain

" Ovisac : large clusters of irregular white ovisacs were found at the bases of the leaves and on the crowns of grass . . . Adult female : small, orange in colour, with a very slight covering of powdery secretion, but without lateral or caudal filaments . . . Mounted specimens average 2·3 mm. long by 1·8 mm. broad." (Brain, *l.c.*).

The following redescription is made from specimens collected by E. C. G. Bedford on roots of grass at Klaserie, Transvaal, South Africa, on 20.iv.1955, which were compared with Brain's paratypes.

Body elliptical, membranous. Margin of body with a complete series of eighteen pairs of cerarii each with two small conical spines, except one or two cerarii of thorax which at times are reduced to one spine only and the interantennal pair which is often provided with three spines. Each cerarius anterior to anal lobe ones is beset by a group of three to seven trilocular pores ; auxiliary setae missing. Anal lobe cerarii each with a loose group of trilocular pores and one to three small auxiliary setae ; area about spines not chitinized. Ventral side of each anal lobe with a robust apical seta, distinctly longer than those of anal ring ; subapical seta about half the length of apical one ; chitinized bar absent. Multilocular disc pores of usual type rather abundant on ventral side of last five abdominal segments, mostly arranged in transverse rows along distal margin. Other multilocular disc pores slightly larger than normal ones, set in groups of two or three—seldom four. Each cluster of pores has associated one to four tubular ducts with oral collar, one which is always smaller and set on middle. On dorsum these clusters of pores are numerous and on thorax and abdomen they are arranged in transverse segmental rows ; on ventral side they mostly occur on thorax and first two abdominal segments and on marginal area of remaining abdominal segments. Quinquelocular pores present only on median and submedian areas of venter, not abundant. Tubular ducts all with one rim, and except for those associated with clusters of large multilocular disc pores, crowded along ventral marginal area of last four abdominal segments anterior to anal lobes and intermingled with normal multilocular disc pores. Trilocular pores not very numerous and evenly distributed. Circular disc pores somewhat smaller than trilocular pores and scattered on either side of body. Dorsal setae very small, spiniform ; ventral ones much longer and slender. Anterior and posterior dorsal ostioles not prominent, lips membranous with a few trilocular pores and small setae. Circulus transversely elongate, membranous. Legs well developed, rather stout, with a few translucent pores on hind tibia ; claw with a small denticle ; ungual digitules slightly knobbed, tarsal ones finely pointed. Antennae with nine joints.

Pseudococcus bechuanae Brain

(Text-fig. 5)

Pseudococcus bechuanae, 1915, *Trans. roy. Soc. S. Afr.* **5** : 108.

Two sides were studied, each containing a single specimen, partly distorted, labelled : " *Pseudococcus bechuanae* Br.; on *Geranium* ; Vryburg, Bechuanaland, 2.xii.1914 ; C. K. Brain ; B. 53 ; C.K.B."[1]

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[1] In the original paper the date is 3.xii.1914. Evidently there has been a mistake on labelling the slides, as all other collecting data are identical.

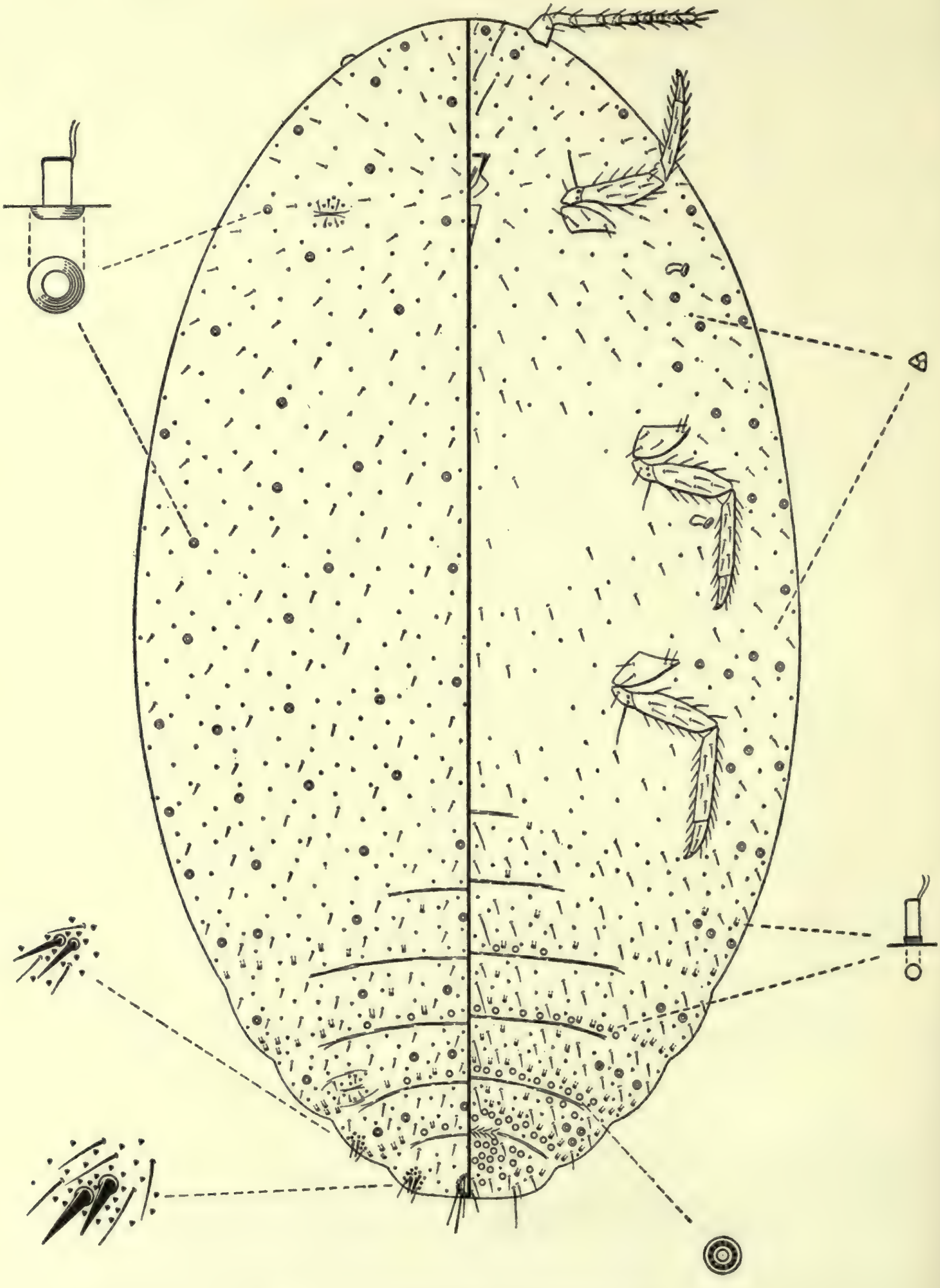

Fig. 5. *Pseudococcus bechuanae* Brain

" The specimens had been badly shaken in the post, but it was clear that large patches of the stem had been completely covered with ovisacs. The white secretion appeared powdery rather than cottony. The females embedded in this were pinkish in colour when young, but purplish in older specimens. There were no lateral filaments, and only two short, blunt, caudal ones. The female when adult reaches approximately 3 mm. in length." (Brain, *l.c.*). Mounted specimens elongate elliptical, membranous. Margin of body provided with anal and preanal cerarii only. Each of them built up with two conical spines surrounded by a small group of trilocular pores and a few slender auxiliary setae ; area about spines not chitinized. Ventral side of each anal lobe without chitinized bar ; apical seta robust, somewhat shorter than those of anal ring ; subapical seta much shorter. Multilocular disc pores rather few and arranged in five groups on ventral side of last abdominal segments. The number of pores in one specimen was as follows : (v) 6 ; (vi) 18 ; (vii) 21 ; (viii) 29 ; (ix + x) 28. A few multilocular disc pores occur on dorsal side of three abdominal segments anterior to anal one. Tubular ducts with oral rim fairly numerous on dorsum and a few scattered along marginal and submarginal areas of abdomen. Tubular ducts with oral collar arranged in four or five groups on ventral marginal area of last abdominal segments anterior to anal lobes ; others distributed in irregular rows in association with dorsal and ventral multilocular disc pores. Trilocular pores rather numerous and uniformly distributed on both sides of body. Circular disc pores apparently absent. Anterior and posterior dorsal ostioles inconspicuous, lips membranous with a small grouping of trilocular pores and a few small setae. Circulus absent. Legs well developed, without translucent pores. Ventral and dorsal body setae very small and slender. Antennae 8-jointed with a pseudoarticulation on apical joint.[1]

Pseudococcus burnerae Brain

(Text-fig. 6)

Pseudococcus burnerae Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 111.
Pseudococcus simulator James, 1933, *Bull. ent. Res.* **24** : 434 (SYN. NOV.).

A fairly long series of specimens from the typical material originally studied by Brain was available. The slides were as follows : four with altogether twelve specimens labelled : " *Pseudococcus burnerae* Brain ; on *Sida longipes* ; Pretoria : Oct. 11, 1914 ; Char. K. Brain ; B. 45, C.K.B." Two more slides of this series contained only eggs, larvae and adult males. Two slides each with a single specimen marked only with the serial number " B. 50, C.K.B." Three slides with altogether twelve specimens also marked with the serial number only " 66, C.K.B.". Three slides each with a single specimen labelled : " *Pseudococcus burnerae* Brain ; on granadilla ;

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[1] *Pseudococcus bechuanae* is so close to *lounsburyi* that a careful and detailed study of a long series of specimens of both species might lead to the conclusion that they are actually synonyms or at most that they represent only forms of the same systematic species. As far as it can be presumed from the structures of the paratypes of both species and from supplementary material of *lounsburyi* examined up to present, *bechuanae* differs from *lounsburyi* by having the tubular ducts of oral collar type confined to the abdominal segments, while in *lounsburyi* they extend as far as the head.

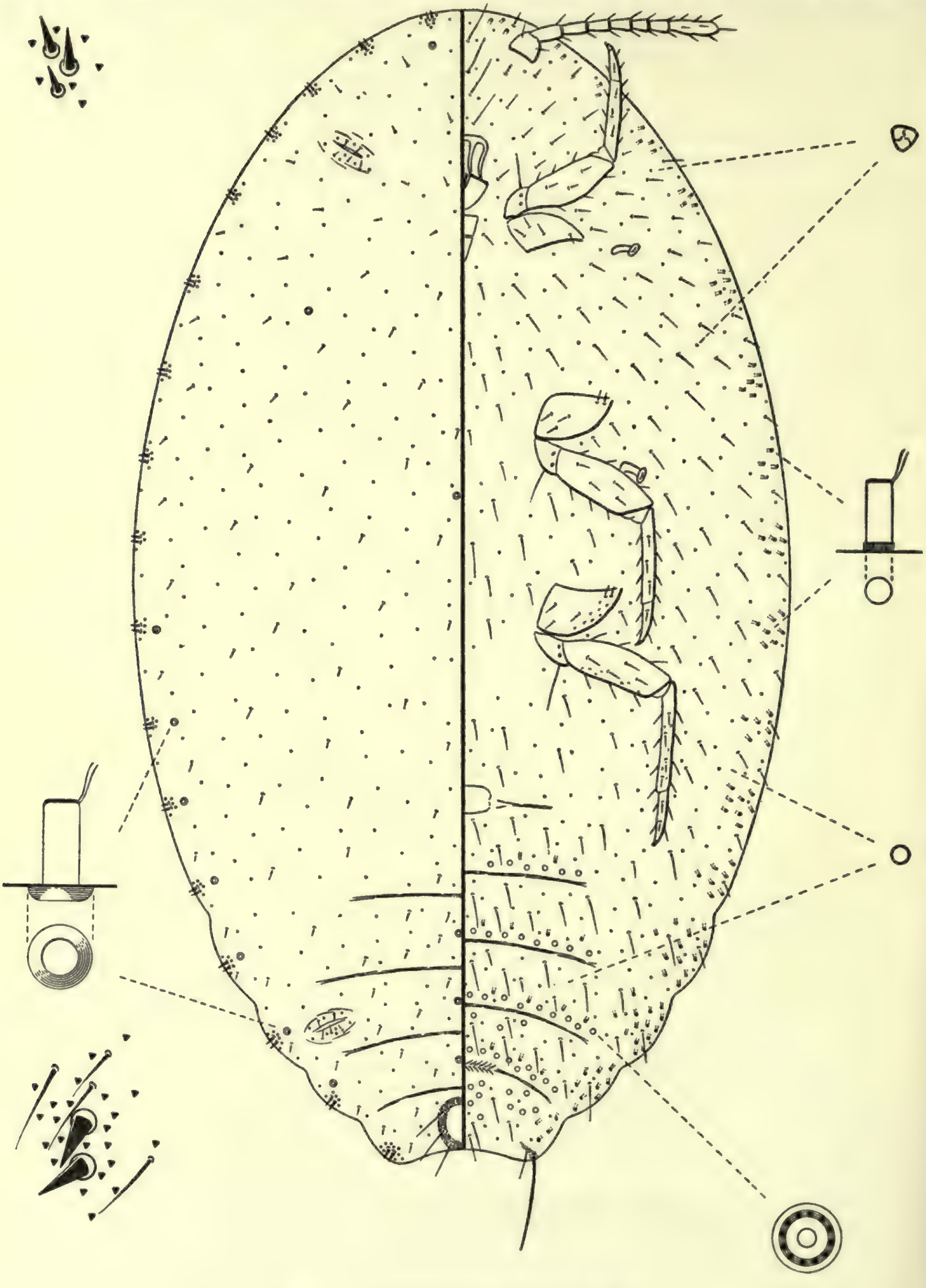

FIG. 6. *Pseudococcus burnerae* Brain

Pretoria: Dec. 1914; paratypes; 66a, C.K.B." Seven more slides with eighteen specimens labelled: "*Pseudococcus burnerae* Brain; Foxslave; Pretoria: 10.i.1915; Char. K. Brain; 47*a*, C.K.B." were also seen, although they do not belong to the typical series.

"Adult females with ovisacs usually aggregated in compact masses on the underside of the leaves of the various host plants. The ovisacs are white, cottony, generally more or less spherical when complete, but the exact contour often obscured by the crowding of many together. The adult female is generally visible on top of the ovisac, the sides of which are raised around the insect. It therefore looks as though it had been pushed into the soft cottony mass. In other cases the insect is found at one side of the ovisac, which protrudes behind and below it, giving a decided *Pulvinaria* effect . . . The adult female is so densely covered with white, powdery secretion that the general body colour is entirely obscured. The colour impression conveyed, however, is grey—perhaps slightly purplish or brown. There is no median, dorsal, clear patch as in *citri*. All filaments are slender except the two caudal ones, which are more delicate than those of *citri*. The caudal filaments may attain one-third the length of the body. The lateral ones are similar to those of *capensis* in that they are shortest at the anterior end, and gradually increase in length towards the posterior extremity. When mounted the adult female is about 2·5 mm. long and 1·5 mm. broad." (Brain, *l.c.*).

The following redescription is based on a series of twelve specimens collected in Pretoria on 16.vii.1954 on *Caralluma caudata* N. E. Br. by Dr. H. K. Munro, which were compared with the Brain's paratypes.

Outline of mounted specimens elliptical. Margin of body with seventeen pairs of cerarii. Anal lobe cerarii each built up with two conical spines beset with a small group of trilocular pores and four or five short auxiliary setae; area about cerarian spines not chitinized. Each of remaining cerarii also with two spines somewhat shorter, except frontal (xvii) and ocular (xvi) each of which have three—occasionally four—spines; each cerarius is surrounded by five to eight trilocular pores without auxiliary setae. Ventral side of anal lobes each with an ill-bordered slightly chitinized bar; apical seta robust, distinctly longer than those of anal ring; subapical one much shorter. Multilocular disc pores distributed in five groups on ventral side of last abdominal segments as follows: (v) 12–19; (vi) 15–21; (vii) 15–20; (viii) 22–26; (ix + x) 15–24. On segments anterior to genital opening they are arranged in transverse rows along distal margin of segment involved. Dorsal tubular ducts with oral rim few; one duct is normally associated with each abdominal cerarius anterior to anal lobe and one duct is always present near each frontal cerarius; one duct on median area of first to third abdominal segments anterior to anal one; occasionally a few ducts are interpolated on median or submedian areas of thorax. Ventral tubular ducts with oral collar crowded all along marginal area; a few are associated with ventral multilocular disc pores. Trilocular pores not numerous and evenly distributed. Circular disc pores smaller than trilocular pores, very few on both sides of body. Dorsal setae few, all short and slender; ventral ones much longer and more abundant. Anterior and posterior dorsal ostioles rather inconspicuous with lips membranous. Circulus rather variable in size, normally small, roundish or elongate, with surface smooth. Legs well developed with some translucent pores on hind coxa, femur and tibia. Antennae with eight joints.

In our paper dealing with the Pseudococcidae described by H. C. James from East Africa (De Lotto, 1957) we sunk *Pseudococcus simulator* James as a synonym of *muraltiae* Brain. In that action we assumed the occurrence of a circulus in Brain's paratype of *muraltiae* studied in London, but examination of further specimens showed that it is not present in the species. After examining one more paratype of *muraltiae* and the long series of slides of *burnerae* above listed, in the collection of the Department of Agriculture in Pretoria, we came to the conclusion that in these two species, which are structurally very similar, the only reliable character on which they depart is the circulus, which in *muraltiae* is entirely missing, whilst in *burnerae* is always present, as is the case in *simulator*. Therefore *Pseudococcus simulator* James is now synonymized with *burnerae* instead of *muraltiae*. In *simulator* the dorsal tubular ducts with oral rim tend to be fewer than in typical *burnerae*, but in all other respects they are identical.

Pseudococcus caffra Brain

(Text-fig. 7)

Pseudococcus caffra Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 138.

One single slide marked with the serial number of Brain's collection " 41, C.K.B." was seen. It contained two specimens originally mounted without having been boiled in KOH or cleaned of the body content. In one specimen both antennae were partly broken away.

Adult female " appeared to have made elongate ovisacs which had been crushed or broken in transit. There was no cottony material present, but rather a dense, powdery secretion. The adult female is orange-brown in colour except at the extremities, which are decidedly pinkish. The largest specimen seen measured 2·4 mm. in length. Mounted specimens average 1·8 mm. in length and 0·8 mm. broad." (Brain, *l.c.*). Mounted specimens very elongate elliptical, membranous. Marginal and anal lobe cerarii entirely missing. Ventral side of anal lobes each with a robust apical seta, somewhat longer than those of anal ring; chitinized bar absent. Multilocular disc pores of usual type very numerous on ventral side of last four abdominal segments; on three segments anterior to genital opening they are arranged in transverse rows near distal margin; other pores are scattered on either side of body. Other larger multilocular disc pores having twenty or more small loculi are fairly abundant on dorsum and on marginal area of abdomen. Tubular ducts with oral collar few on ventral side of last five abdominal segments. Trilocular pores absent. Circular disc pores small, few and scattered on both sides of body. Dorsal setae, few, very short, spiniform; ventral setae more abundant and much longer. Anterior dorsal ostioles not recognizable; posterior ones small, with lips membranous. Circulus absent. Legs long and slender with ungual digitules knobbed; tarsal ones finely pointed; tibiae of hind legs with a few translucent pores; claw without denticle. In the specimen in which the antennae were intact, both were 8-jointed.

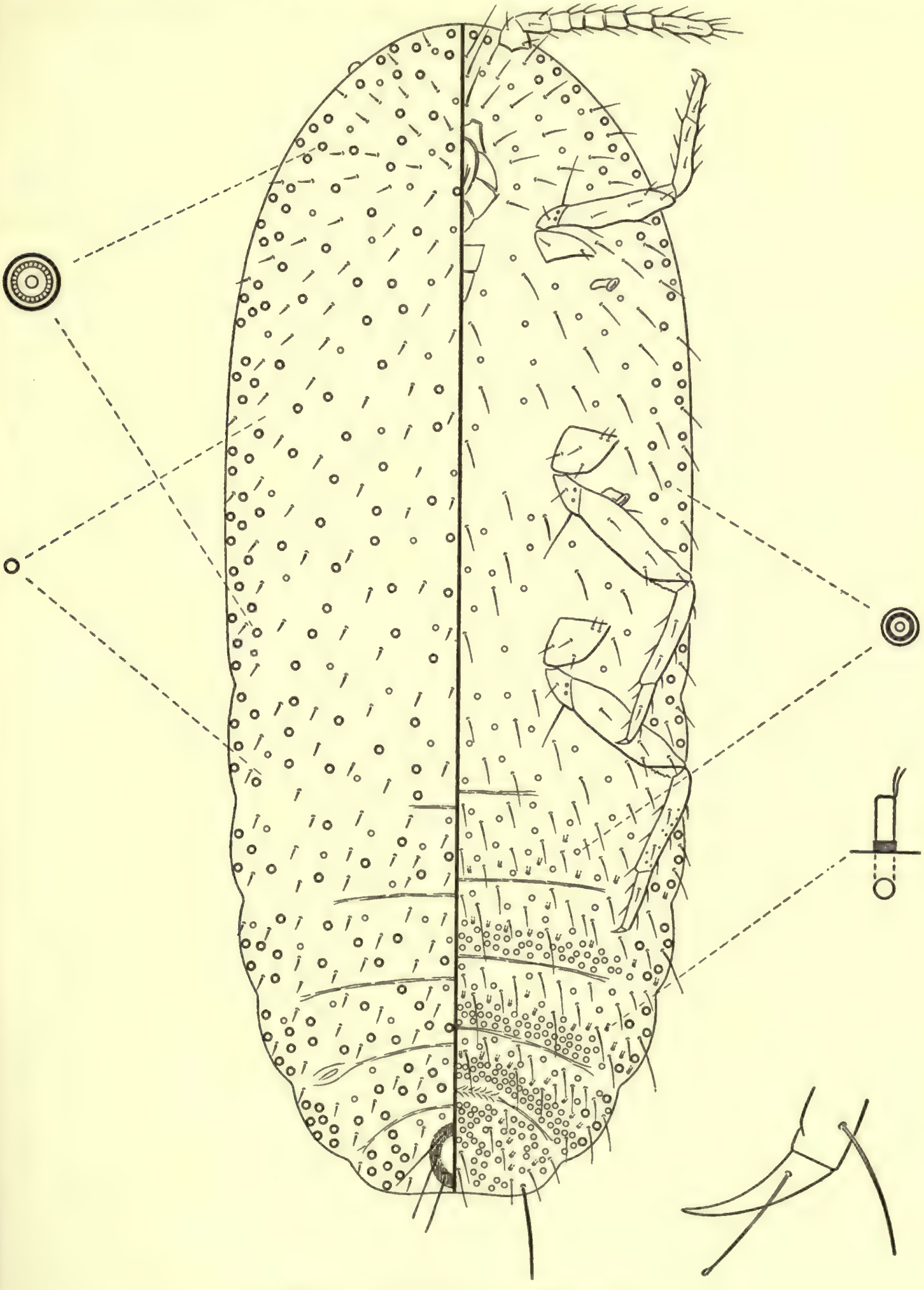

FIG. 7. *Pseudococcus caffra* Brain

Pseudococcus capensis Brain (= ***Pseudococcus maritimus*** (Ehrhorn))

Pseudococcus capensis Brain, 1912, *Ann. ent. Soc. Amer.* **5** : 182.

This species was synonymized with *Pseudococcus maritimus* (Ehrhorn) by Joubert in 1928. A re-examination of some of Brain's types fully supports this action.

Pseudococcus citri phenacocciformis Brain (= ***Planococcus citri*** (Risso))

Pseudococcus citri phenacocciformis Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 116.

Recently Ezzat & McConnell (1956) recognized this variety as identical with *Planococcus citri* (Risso) with which they synonymized it. Two of Brain's types were seen by us and we agree with Ezzat & McConnell's opinion.

Pseudococcus elisabethae Brain (= ***Pseudococcus quaesitus*** Brain)

Pseudococcus elisabethae Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 126.

One slide was seen containing four young adult females, three of which in rather poor condition. It was labelled : " *Pseudococcus rhenosterbosi* Brain ; on rhenosterbosch ; Newlands, C.P.: Jan. 17, 1915 ; paratype ; B. 58, C.K.B." Although the specific name on the label is different from that published by Brain, there are no doubts that the specimens actually belong to *elisabethae* inasmuch as the collection data and serial number are exactly the same as those reported in his original paper.

Pseudococcus elisabethae is structurally identical wih *quaesitus* described by Brain in the same paper and with which it is here synonymized, *quaesitus* having page precedence. Brain's diagnosis of *elisabethae* was based on a series of very young adult females.

Pseudococcus flagrans Brain

(Text-fig. 8)

Pseudococcus flagrans Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 140.

Three slides containing altogether five specimens in rather good condition were seen. All slides were marked with the serial number of Brain's collection : " 69, C.K.B."

" Adult female : elongate, parallel-sided, about 4 mm. long, bright pink to flesh-coloured. No lateral filaments were observed, but in two cases short caudal ones were present, while one insect indicated that there may, in certain cases, be four caudal filaments instead of two . . . Females . . . up to 4 mm. in length." (Brain, *l.c.*). Mounted specimens elongate elliptical, membranous. Margin of body with fifteen to seventeen pairs of cerarii. Anal lobe and preanal lobe cerarii each provided with two slender slightly lanceolate spines. Antepenultimate cerarii each with one or two spines smaller than those of anal lobes. Remaining cerarii each with a single spine ; the spines tending to be progressively smaller anteriorly. Area about cerarian spines not chitinized ; auxiliary setae absent. Apical seta of

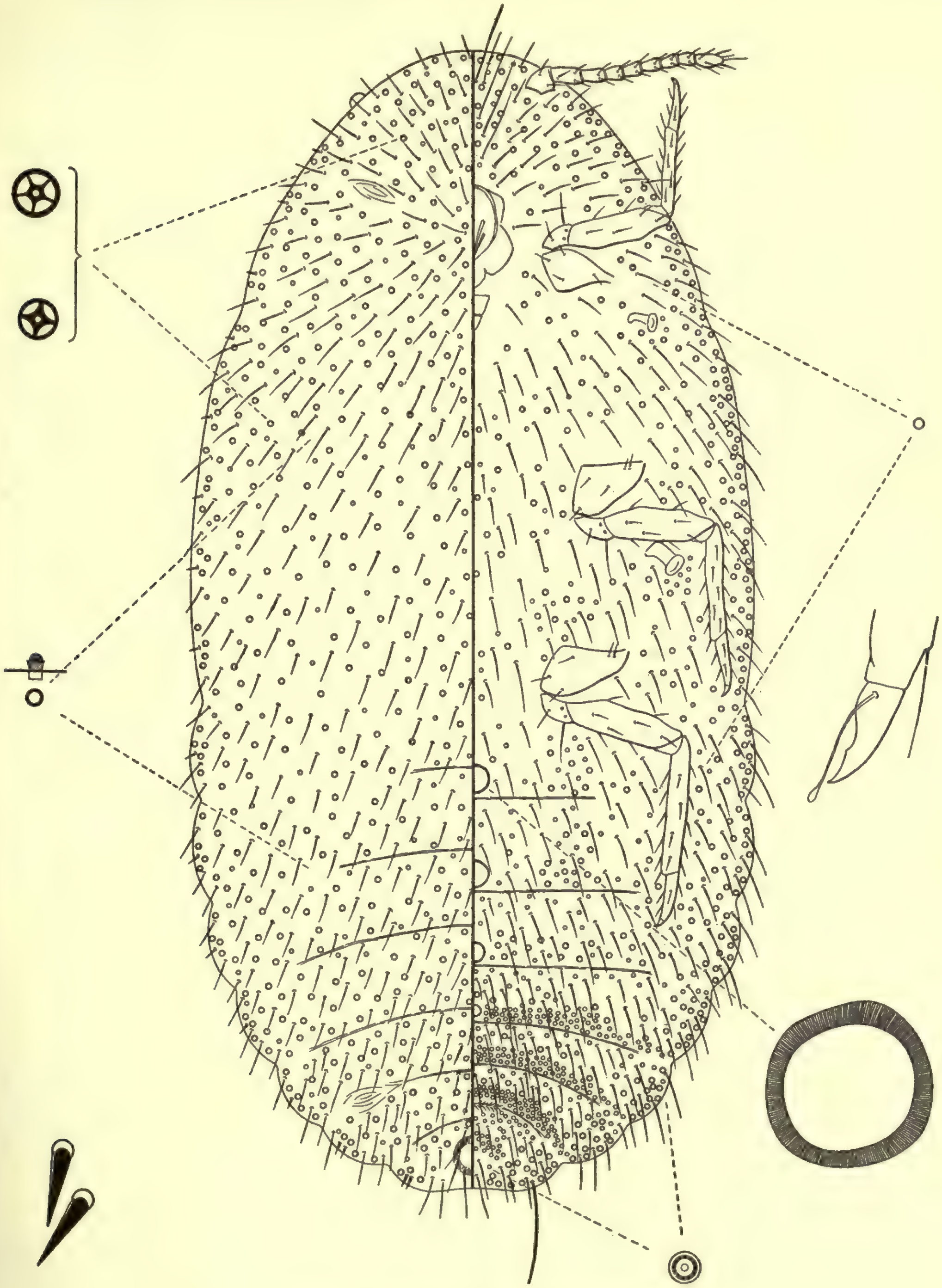

FIG. 8. *Pseudococcus flagrans* Brain

each anal lobe long and robust; dorsal chitinized bar absent. Multilocular disc pores of usual type abundantly distributed all over body and particularly numerous on ventral side of last four abdominal segments. Larger multilocular disc pores represented by a type with five loculi, seldom with four. They are numerous on both sides of body, particularly so on dorsum and marginal area of venter. Tubular ducts very small with inner portion somewhat chitinized, rather numerous on either side of body. Circular disc pores small, not abundant and scattered on venter and dorsum. Trilocular pores entirely absent. Ventral and dorsal setae long, robust and fairly numerous. Anterior and posterior dorsal ostioles rather inconspicuous, lips membranous. Circuli four, circular or nearly so in shape, with surface membranous, rim thick and heavily chitinized. First two circuli about same diameter, third one smaller; the posterior one smaller still and about half the size of anteriors. Legs all well developed with a dentical on claw; tarsal digitules finely pointed, ungual ones knobbed at apex. No translucent pores were seen on hind legs of specimens examined. Antennae with nine joints. Anal ring entire with six robust setae distinctly shorter than apical seta of anal lobes.

Pseudococcus fragilis Brain

Pseudococcus fragilis Brain, 1912, *Ann. ent. Soc. Amer.* **5** : 186.
Pseudococcus gahani Green, 1915, *Ent. mon. Mag.* **51** : 179.

At page 351 of his book *College Entomology*, Essig (1942) recorded *Pseudococcus gahani* Green, 1915 as a synonym of *P. fragilis* Brain, 1912, without giving any indication how he came to this conclusion or on whose authority it was based. In recent correspondence received from Mr. C. J. Joubert of the Stellenbosch-Elsenburg Agricultural College, Stellenbosch, South Africa, we have been informed that several years ago he studied the identity of *fragilis* and *gahani* which he recognized structurally identical. According to him, in 1933 he communicated his finding to Essig who apparently took for granted that by the time his text-book was issued Joubert would have published the result of his investigation, which he has not done.

Independently we came to the same conclusion when at the British Museum (Natural History), London, we compared types or paratypes of both species.

Pseudococcus lounsburyi Brain

Pseudococcus lounsburyi Brain, 1912, *Ann. ent. Soc. Amer.* **5** : 179.

Two slides were available. One with a single specimen, the other with five, all rather young adult females with many setae and cerarian spines broken away and partly attacked by fungi. Both slides bore the following label: "*Pseudococcus lounsburyi* Brain; paratype; but setae of anal lobes lacking; on *Agapanthus* sp.; Kenilworth, S.A.: 14.ix.1910."

Two excellent redescriptions of this species were recently published by Ferris (*in* Zimmerman, 1948; Ferris, 1950). On some remarks on the species contained in the *Atlas of the Scale Insects of North America,* it is pointed out that according to Morrison's opinion the specimens from Hawaii determined by Ferris as *lounsburyi* and used for diagnosis and figure, although very close to it, would not belong to that species in view of a noticeable difference in the number of multilocular disc pores occurring on the ventral side of the abdominal segments. Besides the paratypes above mentioned, at the British Museum (Natural History), London, we examined another slide of the same typical series, and supplementary specimens are at hand from South Africa on *Agapanthus* sp. and on bulbs of *Narcissus* sp. as well as from Kenya also on *Agapanthus* sp. We are prepared to accept the insect redescribed by Ferris as *lounsburyi*, since the number of multilocular disc pores in the species in question is variable and occasionally a few occur even on the dorsum of the last two or three segments anterior to the anal one. Even the number of tubular ducts with oral rim is rather variable.

Pseudococcus mallyi Brain

(Text-fig. 9)

Pseudococcus mallyi Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 120.

The material examined was represented by two slides containing altogether three specimens in fairly good condition, labelled : " *Pseudococcus mallii*[1] Brain ; on grass ; Rosebank, C.P.; Nov. 25, 1914 ; paratype ; Char. K. Brain ; 32, C.K.B." Four other slides not belonging to the typical material, although marked with the same serial number of Brain's collection, were seen. They bore the following label : " *Pseudococcus mallyi* Brain ; on grass ; Rosebank Exp. Sta.: May 10, 1915 ; det. C.K.B.; 32, C.K.B."

" No definite ovisac was seen, but adult females and young were clustered in a white powdery secretion in the leaf sheaths . . . The adult is bright rose-pink in colour, some specimens being uniformly covered with white powder. There were no traces of filaments of any kind. Legs and antennae colourless. The insect is exceptionally long and narrow, mounted specimens averaging 2·16 mm. long by 0·75 mm. broad." (Brain, *l.c.*). Body very elongate elliptical, membranous. Cerarii recognizable only on last three or four abdominal segments. Anal lobe cerarii each with two rather long slender spines of different size. On each of preceding cerarii spines tend to be more slender and set apart each other. Cerarii on third segment anterior to anal lobes at times represented by a single spine. All cerarii without auxiliary setae or grouping of trilocular pores ; area about spines not chitinized. Ventral side of each anal lobe without chitinized bar ; apical seta robust and longer than those of anal ring ; subapical one much shorter. Multilocular disc pores rather numerous and distributed on either side of body ; on ventral side of two segments anterior to genital opening several pores are crowded in transverse rows along distal margin. Trilocular and quinquelocular pores entirely absent. Tubular ducts of oral collar type very short, not numerous and distributed on venter and dorsum without any peculiar arrangement. Circular disc pores few and scattered on both sides of body. Dorsal setae very short, spiniform, rather few ; ventral setae more numerous and much longer. Anterior dorsal ostioles absent ; posterior ones incon-

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[1] Evidently a pen slip for *mallyi*.

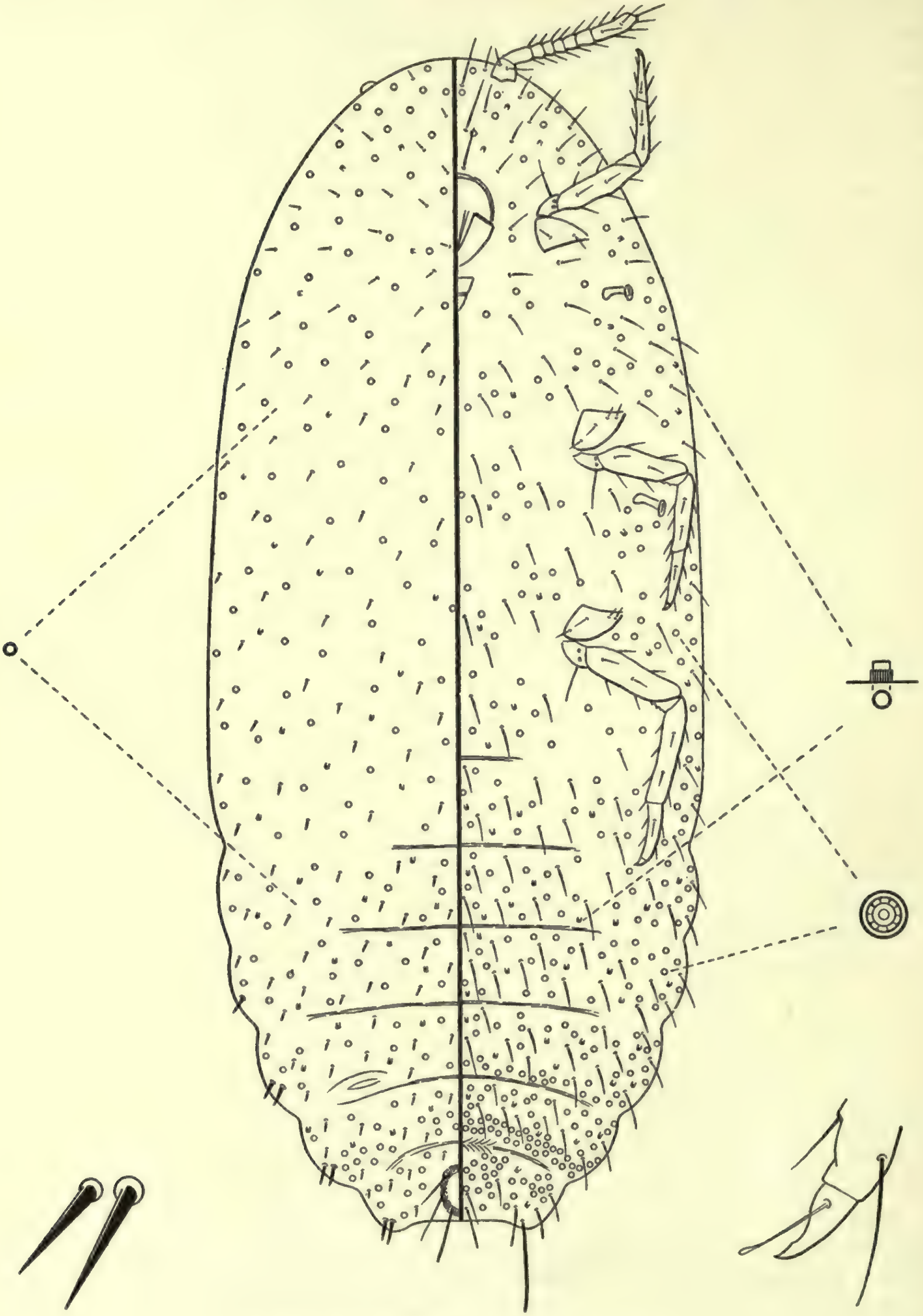

FIG. 9. *Pseudococcus mallyi* Brain

spicuous with lips membranous and without trilocular glands or setae. Circulus missing. Legs all well developed with a small denticle on claw; tarsal digitules finely pointed; ungual ones knobbed at apex. Antennae with eight short and stout joints. Anal ring entire with six robost setae.

Pseudococcus mirabilis Brain

(Text-fig. 10)

Pseudococcus mirabilis Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 121.

Four slides of which three containing a single specimen and one with five specimens were available. Two slides were labelled: "*Pseudococcus mirabilis* Br.; on[1]; Ceres, C.P.; Oct. 1898; B. 54; C.K.B." Remaining two slides marked only "*Pseudococcus mirabilis*; B. 54, C.K.B." All specimens were adult females in very poor condition, partly broken and badly distorted.

"The ovisacs are creamy-white or slightly buff-coloured, and are aggregated on the leaf-cluster bases in conspicuous masses . . . The adult is apparently viviparous . . . When fully distended it is no more than 1·5 mm. long." (Brain, *l.c.*). Mounted specimens elongate to very broadly elliptical with dermis membranous. Marginal cerarii present only on last three—occasionally four—abdominal segments. Each cerarius is formed by two stout conical spines surrounded by many tubular ducts, without any grouping of trilocular pores; auxiliary setae absent; area about cerarian spines not chitinized. Third cerarius anterior to anal lobe one, when present, reduced to a single spine. Ventral side of each anal cerarius with a robust apical seta about same size as those of anal ring; chitinized bar absent. Multilocular disc pores arranged in five ventral groups. The number of pores in one specimen was as follows: (v) 17; (vi) 25; (vii) 26; (viii) 27; (ix + x) 29. On segments anterior to genital opening they are set in fairly linear transverse rows along distal margin. A few pores are scattered on dorsum of abdomen. Tubular ducts with oral collar of two different sizes. Large ones set in groups on ventral and dorsal marginal areas as far as head; a few others arranged on dorsum along distal margin of abdominal segments anterior to anal lobes. Tubular ducts of smaller size occurring in transverse irregular rows on either side of abdomen; others scattered all over body. Trilocular pores very few and uniformly distributed. Circular disc pores about half the size of trilocular pores, few and scattered on dorsum and venter. Dorsal and ventral setae about same size, all rather short, stout to very stout, not numerous; a few setae on dorsum of last abdominal segments similar in shape and size to those of marginal cerarii. Anterior dorsal ostioles not recognizable; posterior ones fairly prominent with lips membranous and provided with a few small setae and trilocular pores. Circulus absent. Legs well developed, with some translucent pores on hind femur and coxa; claw without denticle; ungual and tarsal digitules apically knobbed. Anal ring V-shaped with six setae. Antennae 7-jointed with a pseudo-articulation on apical joint.

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[1] The name of the host plant is omitted. According to the original description it is *Borbonia cordata* L.

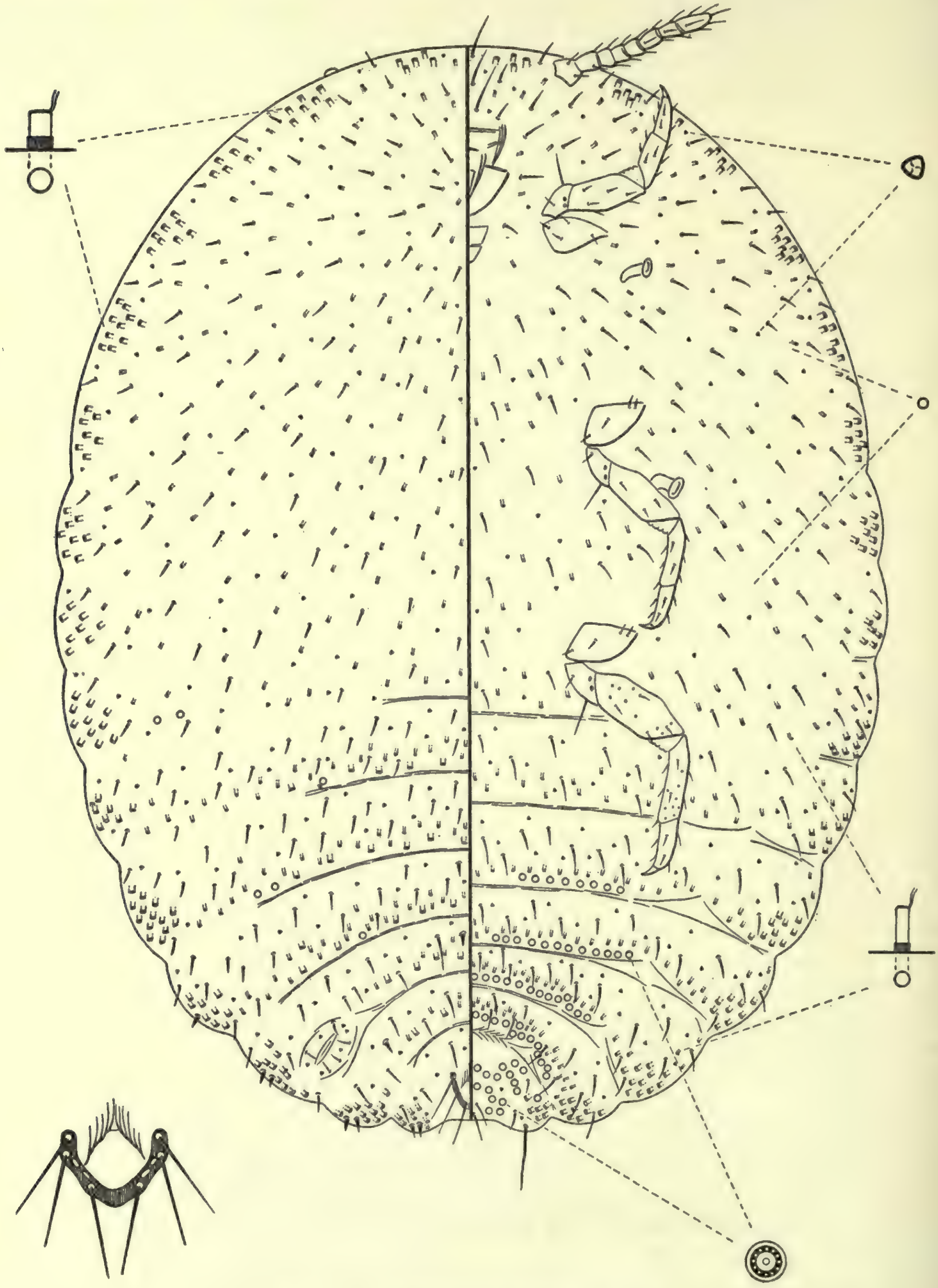

FIG. 10. *Pseudococcus mirabilis* Brain

Pseudococcus muraltiae Brain

(Text-fig. 11)

Pseudococcus muraltiae Brain, 1912, *Ann. ent. Soc. Amer.* **5** : 184.

Two slides were seen in Pretoria, one of which containing larvae ; the second with a single specimen distorted and partly broken labelled : "*Pseudococcus muraltiae* Brain ; on *Muraltia heisteria*; Newlands : 22.x.1910 ; paratype ; 52, C.K.B." Another slide with two specimens bearing the same collecting data was previously examined at the British Museum (Natural History), London.

"Adult female : small ; largest specimens, with completed ovisac, was 1·9 mm. long by 1·13 mm. broad, slatey-grey in colour ; waxy secretion scant but segmentation conspicuous. Lateral appendages were absent but usually four caudal ones present." (Brain, *l.c.*). Body of mounted specimens rather broadly elliptical, membranous. Margin of body with seventeen pairs of cerarii. Anal lobe cerarii each with two moderately robust conical spines beset by few trilocular pores and four to six small slender auxiliary setae. Area about spines not chitinized. Each of remaining cerarii with two spines which tend to be more slender anteriorly, where they attain about same size and shape as dorsal setae ; each cerarius is surrounded by a group of two to five trilocular pores without auxiliary setae ; one or two thoracic cerarii reduced to a single spine. Ventral side of each anal lobe without chitinized bar ; apical seta robust, longer than those of anal ring ; subapical one much shorter. Multilocular disc pores few, occurring on ventral side of last five abdominal segments. The number of pores in one specimen was as follows : (v) 3 ; (vi) 19 ; (vii) 17 ; (viii) 45 ; (ix + x) 16. On segments anterior to genital opening they are arranged in transverse rows along distal margin only. Ventral tubular ducts with oral collar not numerous and mostly distributed on marginal area of last five or six abdominal segments ; a few occur on median and submedian areas in association with multilocular disc pores. Dorsal tubular ducts with oral rim very few. One duct is normally associated with each frontal cerarius and one with each preanal cerarius; two or three occasionally occur on thorax and one on median area of preanal segment. Trilocular pores not abundant but evenly distributed. Circular disc pores noticeably smaller than trilocular pores, very few and scattered. Ventral setae moderately long and slender; dorsal ones much shorter. Circulus absent. Anterior and posterior dorsal ostioles inconspicuous with lips membranous and provided with two or three small setae and a few trilocular pores. Legs well developed but rather short with a few translucent pores on hind coxa. Antennae with eight joints.

The synonymy of *Pseudococcus simulator* James with *muraltiae* published in our previous paper (De Lotto, 1957) has to be rejected because in *muraltiae* the circulus is absent. *P. simulator* is instead a synonym of *burnerae* as pointed out in our notes on dealing with that species.

Pseudococcus natalensis Brain (= ***Nipaecoccus graminis*** (Maskell))

Pseudococcus natalensis Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 100.

We have been kindly informed by Dr. D. J. Williams of the Commonwealth Institute of Entomology, London, that this species is identical with *Nipaecoccus*

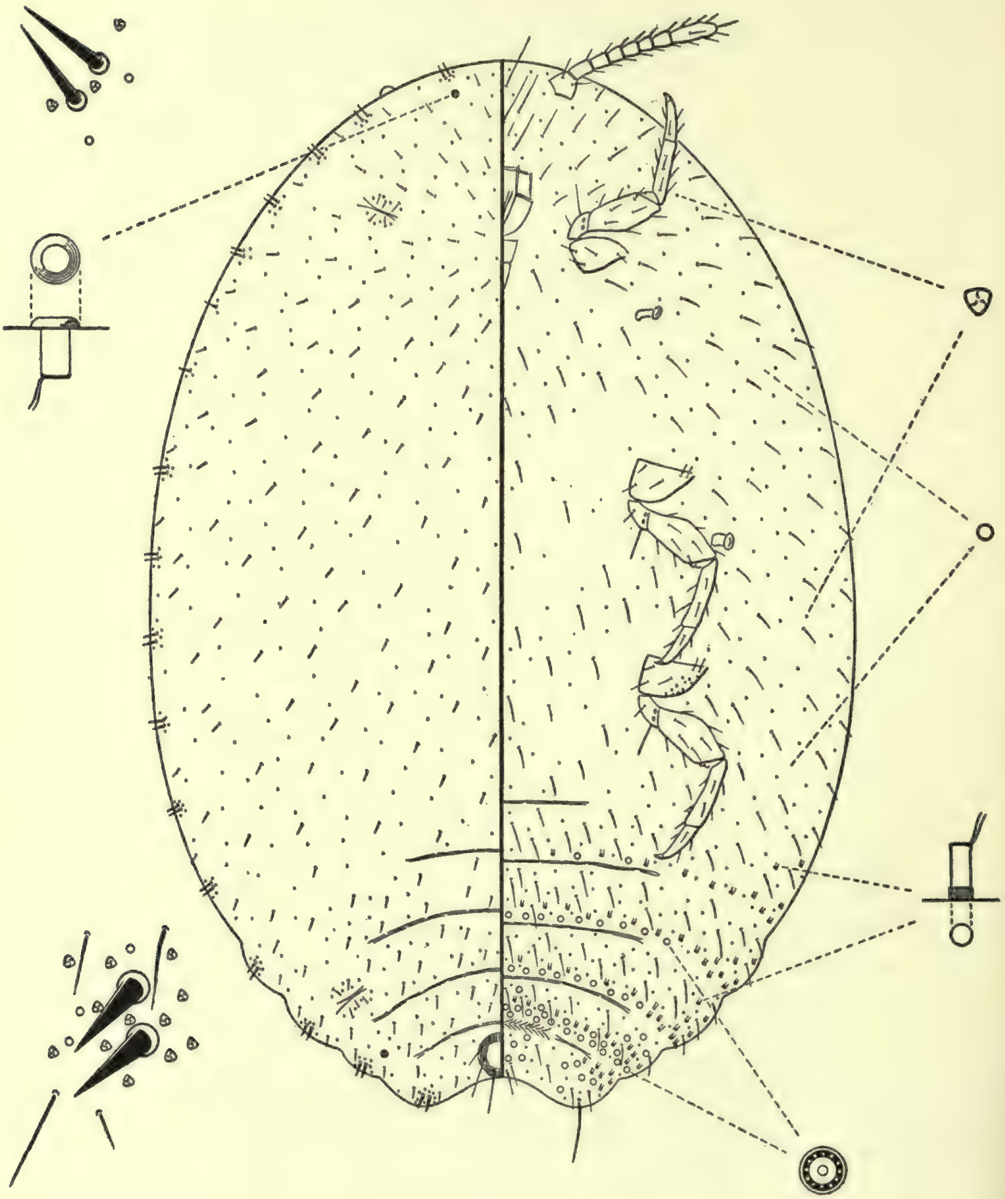

FIG. 11. *Pseudococcus muraltiae* Brain

graminis (Maskell). Recently he examined type material of Maskell's species and this new synonymy is dealt with in his paper on Pseudococcidae described by Maskell, Cockerell, Newstead and Green from the Ethiopian region (1958).

Pseudococcus nitidus Brain

(Text-fig. 12)

Pseudococcus nitidus Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 143.

The material examined was represented by six slides, three of which each contained a single specimen labelled : " *Pseudococcus nitidus* Brain ; on *Acacia caffra* ; Pretoria: Nov. 1914 ; paratype ; 39, C.K.B." All specimens were in very poor condition, distorted and partly broken, having been mounted from dry material. The remaining three slides contained only larvae and males.

" The ovisacs . . . are closely felted, smooth, and in the majority of cases have the shape and approximate size of an adult insect, being about 3 mm. long and so smoothly felted on the exterior as to look like a piece of white kid . . . Adult female 2·5 mm. long, translucent brown in colour ; legs and antennae of the same colour. No waxy secretion and no filaments except two extremely short caudal ones which appear as two white specks." (Brain, *l.c.*). Body of mounted specimens rather elongate elliptical with anal lobes strongly developed ; dermis at maturity membranous. Margin of body with only five pairs of cerarii on last abdominal segments. Anal lobe cerarii each formed with two small conical spines set apart from each other, without auxiliary setae or grouping of trilocular pores ; area about spines clear. Remaining cerarii each with two spines which tend to be smaller and more widely separate from each other anteriorly ; on fourth cerarius anterior to the anal lobe one they attain shape and size of dorsal setae. Ventral side of each anal lobe with a long and robust apical seta and a much shorter subapical one ; chitinized bar absent. Multilocular disc pores few and present only on ventral side of last three abdominal segments. The number of pores in one specimen was as follows: (vii) 11 ; (viii) 24 ; (ix + x) 32. On segments (vii) and (viii) they are arranged in transverse rows along distal margin only. Tubular ducts with oral collar very few on ventral side of last abdominal segments, mostly in association with multilocular disc pores. Tubular ducts with oral rim very numerous on dorsum and extending all along marginal area of venter. Quinquelocular pores fairly abundant on median and submedian areas of venter except on segment posterior to genital opening, where they are missing. Trilocular pores not numerous and evenly distributed. Circular disc pores apparently absent. Anterior and posterior dorsal ostioles not detected. Circulus absent. Legs long and rather slender, with a small denticle on claw ; ungual digitules knobbed at apex ; tarsal ones finely pointed ; no translucent pores on hind legs. Anal ring of Pseudococcid type, with six setae. Stigmatic openings unusually large. Dorsal setae rather few, small, spiniform ; ventral ones longer and slender. Antennae formed by nine long slender joints.

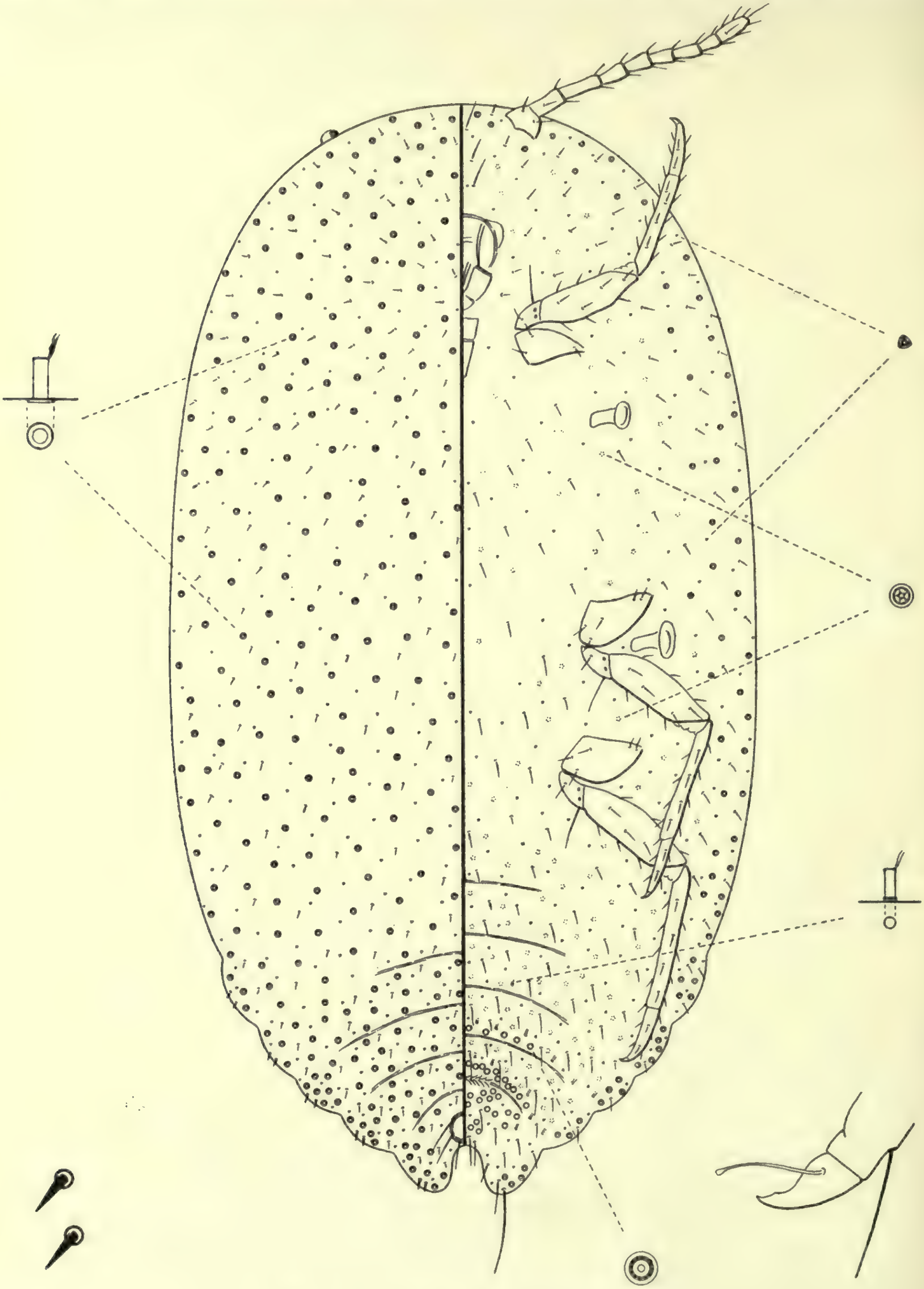

FIG. 12. *Pseudococcus nitidus* Brain

Pseudococcus quaesitus Brain

(Text-fig. 13)

Pseudococcus quaesitus Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 123.
Pseudococcus elisabethae Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 126 (SYN. NOV.).
Pseudococcus trichiliae Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 131 (SYN. NOV.).

The material available consisted on one slide labelled : " larvae of *Pseudococcus quaesitus* Brain ; Pretoria : Nov. 1914 ; larvae ; 60, C.K.B."; another slide labelled: " ♂ of *Pseudococcus quaesitus* Brain ; Pretoria ; ♂ paratype ; ♂ 60 ; Nov. 16, 1914." Six more slides were marked with the serial number " 60, C.K.B." one of which with larvae only ; the remaining five slides contained altogether eleven old adult females. Three more slides with altogether nine old adult females bore the following data : " *Pseudococcus quaesitus* Brain ; *Acacia horrida* ; Grahamstown : Jan. 1899 ; dry material ; 63 ".

" The ovisacs are often collected into masses which remind one of *Ps. filamentosus* Ckll., but present a pinkish tinge rather than yellow or greyish. Seen singly as in cavities in tree-trunks, the ovisacs are usually more or less button-shaped, with straight vertical sides and a rounded top. The largest observed measured approximately 3 mm. in diameter . . . Adult female may reach 4 mm. in length, pinkish coloured at first and later purplish, with dense, white, powdery secretion. Lateral filaments short and fragile. Caudal filaments two in number, stout, may attain one third the length of the body." (Brain, *l.c.*). Body of mounted specimens elliptical. Margin of body with a series of seventeen pairs of cerarii. Anal lobe cerarii each formed by two conical spines surrounded by a small group of trilocular pores and a few slender auxiliary setae ; area about spines not chitinized. Remaining cerarii each with two spines which tend to be noticeably more slender anteriorly. Each cerarius is associated with a grouping of a few trilocular pores but no auxiliary setae. Ventral side of each anal lobe with a robust apical seta, longer than those of anal ring ; subapical seta very short ; chitinized bar absent. Multilocular disc pores rather few and arranged in five groups on ventral side of last abdominal segments. The number of pores in one specimen was as follows : (v) 24 ; (vi) 19 ; (vii) 21 ; (viii) 29 ; (ix + x) 21. On segments anterior to genital opening they are set in transverse rows along distal margin. Tubular ducts with oral collar set in five or six small groups on ventral marginal area of abdomen. Tubular ducts with oral rim fairly numerous on dorsum and a few on venter on marginal and submarginal areas of thorax. Trilocular pores moderately numerous and uniformly distributed on both sides of body. Circular disc pores apparently absent. Dorsal setae short ; ventral ones longer but slender, in either case not numerous. Anterior and posterior dorsal ostioles well developed with lips membranous having some trilocular pores and a few short setae. Circulus absent. Legs well developed, robust, with a few translucent pores on hind femur. Anal ring normal, with six setae. Antennae 8-jointed, at times with a pseudoarticulation on apical joint.

Pseudococcus elisabethae and *trichiliae* described by Brain in the same paper are synonyms of *quaesitus*.

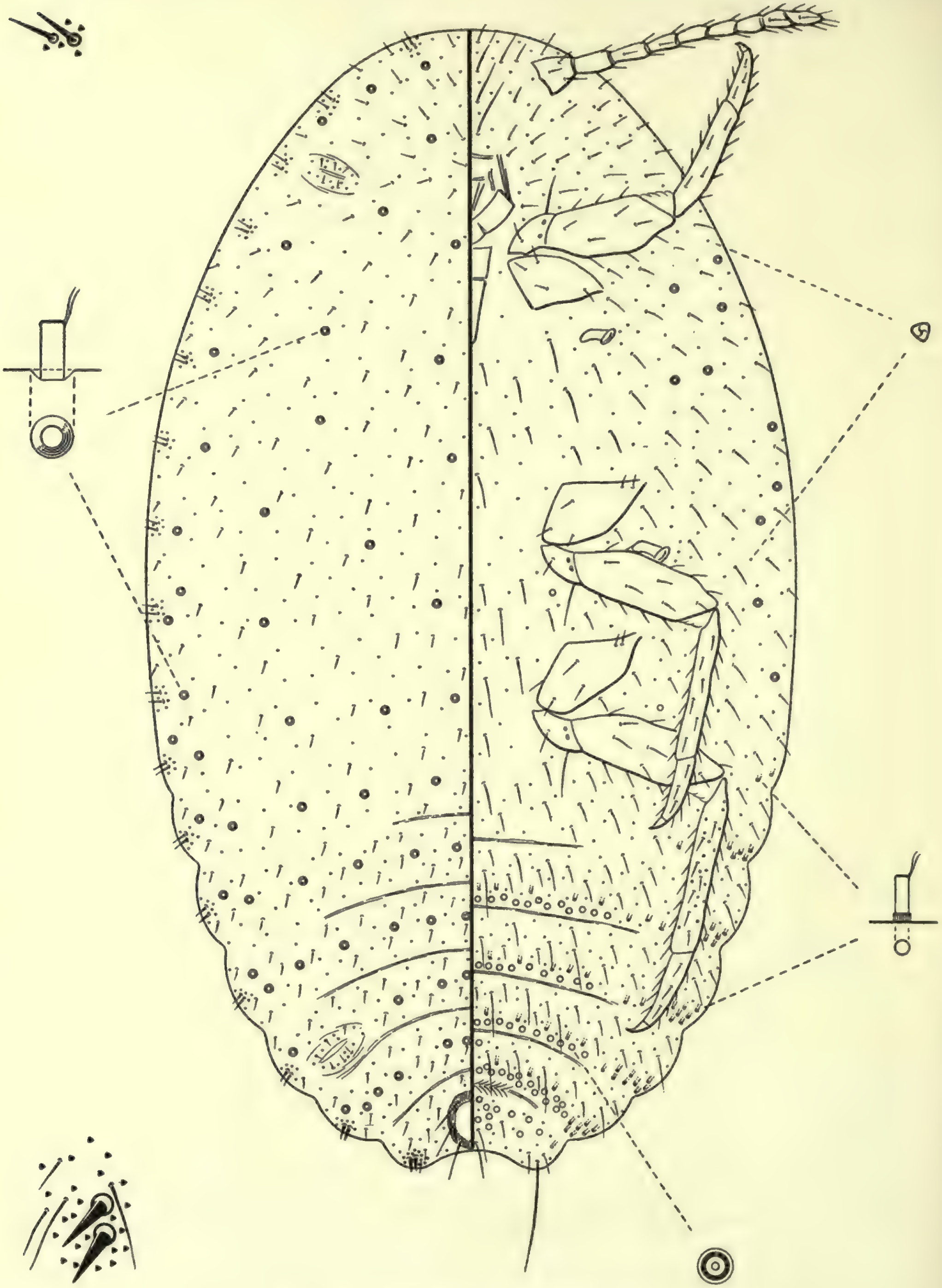

FIG. 13. *Pseudococcus quaesitus* Brain

Pseudococcus segnis Brain

(Text-fig. 14)

Pseudococcus segnis Brain, 1915, *Trans. roy Soc. S. Afr.* **5** : 145.

One slide with a single very old adult female in fairly good condition was made available from the U.S. National collection of Coccidae, Washington, D.C. It bore the following data : " *Pseudococcus segnis* Brain ; Stellenbosch : 17.xii.1914 ; B. 55, C.K.B." Although the collecting data is not exactly the same recorded in Brain's paper, that is 13th December, 1914, the serial number is identical and we can assume that the specimen acually belongs to the original type series.

" Adult female : the four specimens range from 2·8 to 3·4 mm. in length, and are dark olivaceous-green in colour. There are no lateral or caudal filaments, and only a slight trace of white secretion, the insects appearing rather greasy or slug-like. This absence of secretion may be due to shaking in transit." (Brain, *l.c.*). Body elliptical with eighteen pairs of cerarii. Anal lobe cerarii each apparently formed by two spines[1] surrounded by eight to ten trilocular pores ; auxiliary setae absent ; area about spines not chitinized. Remaining cerarii each provided with two small and slender conical spines which on most anterior pairs are not differentiated from setae of dorsum. Each cerarius is beset by five to eight trilocular pores. Ventral side of each anal lobe without chitinized bar ; apical seta about as long as those of anal ring ; subapical one shorter. Multilocular disc pores, tubular ducts and circular disc pores entirely absent. Trilocular pores fairly abundant and uniformly distributed. Dorsal setae few and very small, spiniform ; ventral setae also few but much longer. Anterior and posterior dorsal ostioles well developed, lips membranous with many trilocular pores and a few minute setae. Circulus absent. Legs normal with a denticle on claw ; ungual and tarsal digitules apparently pointed ; hind legs without translucent pores. Antennae 9-jointed.

Pseudococcus socialis Brain

(Text-fig. 15)

Pseudococcus socialis Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 103.

Three slides, one with ova and two with altogether three specimens in fairly good condition were seen. All were labelled : " *Pseudococcus solitarius* sp. n.; Pretoria, Union Buildings : 20.xi.1914 ; C.K.B.; on grass ; C.K.B.; 52 B." Even in this instance the specific name under which the species was described does not agree with that originally assigned on the type slides. Nevertheless there were no doubts that the material belonged to *socialis* as all collecting data and serial number are exactly the same as this species referred by Brain in his paper.

" Ovisac : an irregular mass of white cottony secretion, about 3 mm. in diameter . . . The adult female is elongate, of a purplish-brown colour, the whole body being slightly powdered with white. There were no signs of lateral or caudal filaments . . . The average size of female insects (containing ova) when mounted is 1·7 mm.

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[1] In the specimens examined all cerarian spines of the anal lobes were broken away.

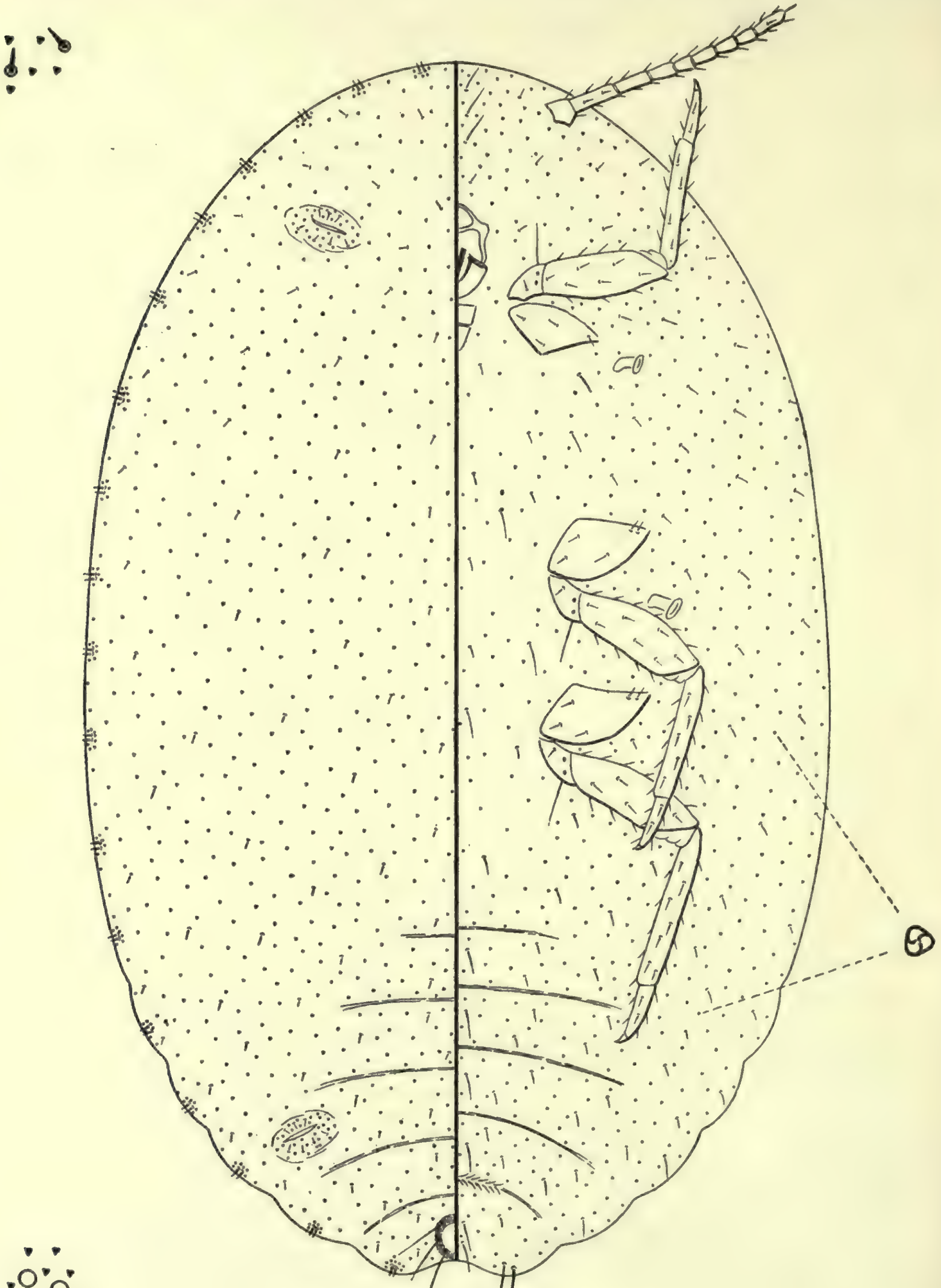

FIG. 14. *Pseudococcus segnis* Brain

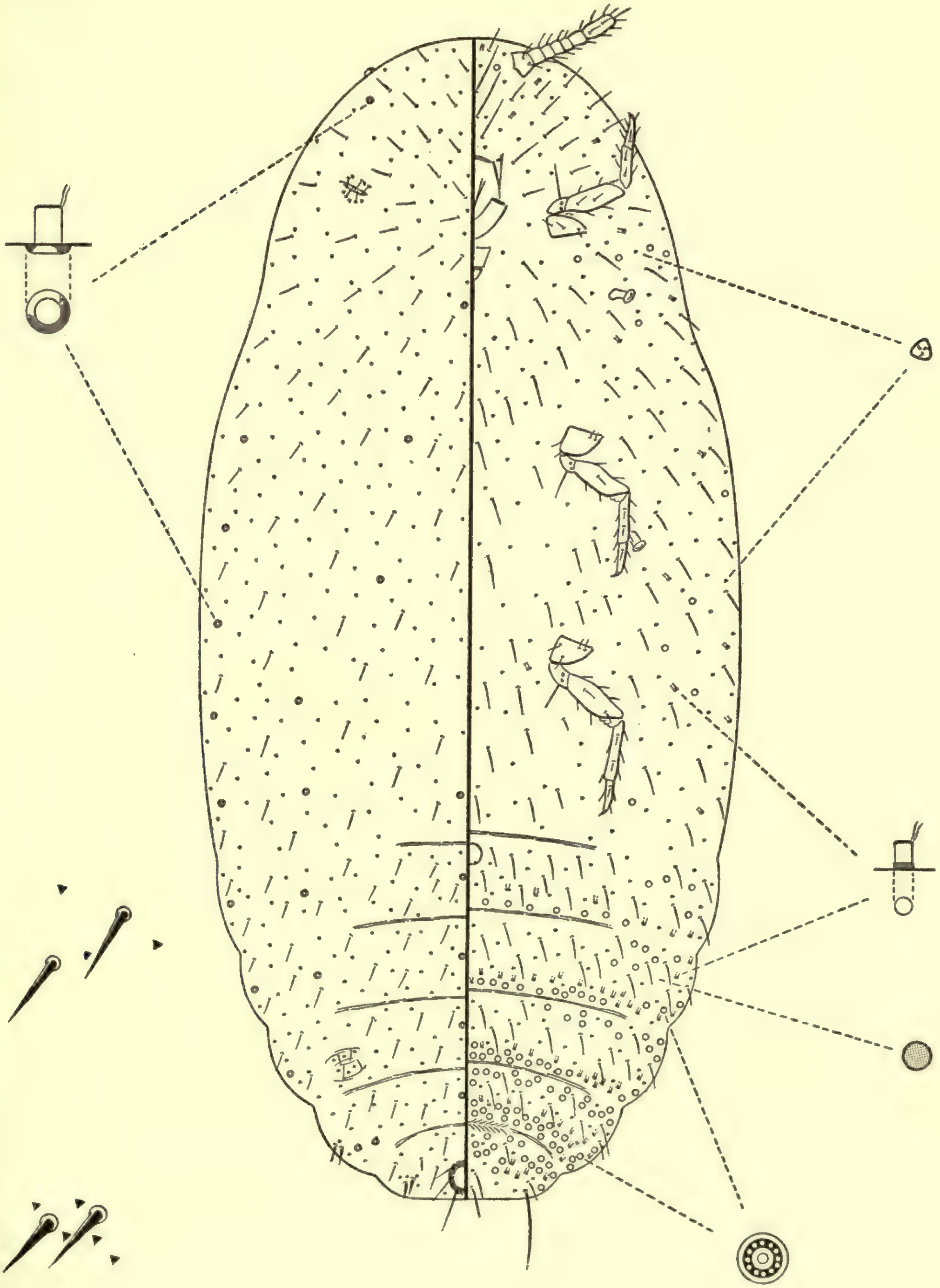

FIG. 15. *Pseudococcus socialis* Brain

long and 0·8 mm. broad." (Brain, *l.c.*). Body elongate elliptical, membranous. Marginal cerarii recognizable only on last two abdominal segments. Anal lobe cerarii each with two rather slender conical spines beset by a few trilocular pores; area about cerarian spines not chitinized; auxiliary setae absent. Preanal cerarii each with two spines more slender and set somewhat apart from each other, without grouping of trilocular pores or auxiliary setae. Ventral side of each anal lobe with a robust apical seta noticeably longer than those of anal ring; subapical seta much shorter; chitinized bar absent. Multilocular disc pores arranged in five groups on ventral side of last abdominal segments. The number of pores in one specimen was as follows: (v) 14; (vi) 35; (vii) 64; (viii) 75; (ix + x) 26. A few pores scattered on marginal and submarginal ventral areas of thorax and head. Dorsal tubular ducts with oral rim few. One occurring on median line of each abdominal segment (iv) to (viii); one on marginal area of each abdominal and thoracic segment; a few more widely scattered. Tubular ducts with oral collar set in transverse irregular rows on last abdominal segments in association with multilocular disc pores and a few widely scattered all over ventral side of body. Trilocular pores not numerous and evenly distributed all over body. Circular disc pores about same size as trilocular pores, having a granulate surface; they are few and apparently present only on ventral side of abdomen. Dorsal and ventral setae rather few, slender. Anterior and posterior dorsal ostioles not prominent but with lips membranous and with a grouping of a few trilocular pores and two to four minute setae. Circulus small, rounded, with border fairly highly chitinized, set near basal margin of fifth abdominal segment. Legs all short otherwise normal, with some translucent pores. Antennae short, built up with seven joints.

Pseudococcus solitarius Brain (= ***Nipaecoccus vastator*** (Maskell)) (SYN. NOV.)

Pseudococcus solitarius Brain, 1915, *Trans. roy. Soc. S. Afr.* **5**: 104.

Three slides containing altogether six specimens, all badly distorted and broken were examined. They bore the following label: "*Pseudococcus solitarius* sp. n.; Transvaal, Pretoria and dist.: Sept.–Oct. 1914; C.K.B.; on thorn tree; C.K.B., 65." Carefully examined this species was found identical with *Nipaecoccus vastator* (Maskell) with which it is synonymized.

Pseudococcus stelli Brain

(Text-fig. 16)

Pseudococcus stelli Brain, 1915, *Trans. roy. Soc. S. Afr.* **5**: 146.

Of three slides seen, only one contained a single adult female in fairly good condition. It was labelled: "*Pseudococcus stelli* Brain; on *Borbonia cordata* Linn.; Stellenbosch: Dec. 17, 1914; paratypes; B. 56, C.K.B." The remaining two slides contained males, larvae and ova only.

"Ovisac: the ovisacs are rounded masses of cottony material . . . In form they appear almost spherical . . . The greatest diameter averages approximately 2·5 mm. . . . The adult female is pale canary-yellow in colour, about 2 mm.

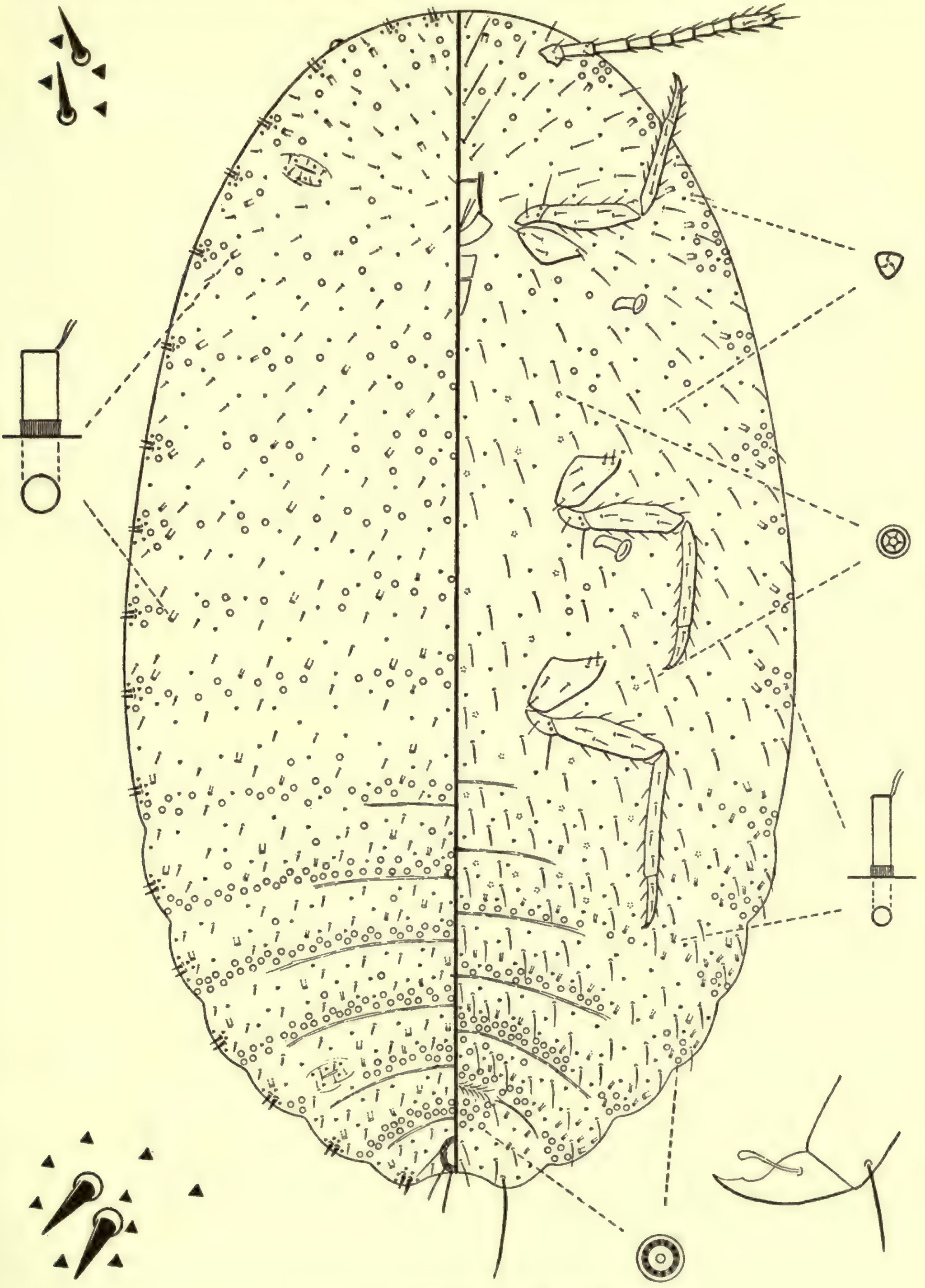

FIG. 16. *Pseudococcus stelli* Brain

to 2·5 mm. long. The lateral filaments are very short, but distinct and gradually increase in length posteriorly. The caudal ones, two in number, are also short, about twice as long as the next pair, stout at the base and tapering towards the tip." (Brain, *l.c.*). Mounted specimens elliptical, membranous. Margin of body with a complete series of eighteen pairs of cerarii. One of anal lobe cerarii was provided with two conical spines ; opposite one with three ; both surrounded by a group of a few trilocular pores ; auxiliary setae missing ; area about spines not chitinized. All remaining cerarii each formed with two spines more slender than those of anal lobe ones, beset by three to seven trilocular pores, without auxiliary setae. Ventral side of each anal lobe with a robust apical seta longer than those of anal ring ; subapical seta much shorter ; chitinized bar absent. Multilocular disc pores abundant on both sides of body, particularly so on dorsum ; on abdomen they tend to be crowded in transverse segmental rows along distal margin of last segments. Quinquelocular pores rather few and scattered on median and submedian ventral areas of thorax and first two abdominal segments. Trilocular pores not numerous and evenly distributed. Circular disc pores apparently absent. Tubular ducts with oral rim entirely missing. Tubular ducts with oral collar of two sizes. Small ones rather few on ventral marginal area of all abdominal segments and in associatiation with ventral abdominal multilocular disc pores. One—occasionally two—tubular ducts of large size occur on dorsal and ventral marginal areas near each cerarius ; others are scattered all over dorsum. Dorsal setae very short ; ventral ones much longer but slender ; in neither case abundant. Anterior and posterior dorsal ostioles not prominent, with lips membranous having a cluster of a few trilocular pores and two to four small setae. Circulus may or may not be present because the area where normally it occurs was broken away on specimen examined. Legs all well developed, without translucent pores ; claw with a small denticle ; ungual digitules short and knobbed apically ; tarsal ones finely pointed. Antennae with nine joints.

Pseudococcus stelli tylococciformis Brain
(= ***Pseudococcus stelli*** Brain) (SYN. NOV.)

Pseudococcus stelli tylococciformis Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 149.

This variety was described on a few specimens collected on the same twigs as those attacked by *P. stelli* with which, according to Brain, they were identical except that they were smaller and the marginal cerarii were inserted on small tubercles a character peculiar to almost all species at the beginning of the adult stage. Although no types, paratypes or else could be seen, we definitely regard this variety as based on very young adult females of *stelli* with which it is here synonymized.

Pseudococcus transvaalensis Brain

Pseudococcus transvaalensis Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 129.
Trionymus sanguineus James, 1936, *Trans. R. ent. Soc. Lond.* **85** : 197 (SYN. NOV.).

The material of this species examined was as follows : six slides one of which contained larvae and the remaining five with altogether nine specimens, all marked with Brain's serial number " B. 46, C.K.B." Two other slides contained altogether three specimens marked with the serial number only " B. 47, C.K.B." Four more slides of which three with a single specimen and one with larvae, all labelled : " *Pseudococcus transvaalensis* Brain ; roots of cornflower ; Pretoria ; 27.xii.1914 ; C.K.B.; B. 47a, C.K.B." In the original paper the collecting data of these specimens is reported as 28 Dec. 1914, which has to be explained as a pen slip made by Brain on labelling the slides.

All above listed material was carefully compared with specimens of *Trionymus sanguineus* James from Kenya and found structurally identical. The James species which has been redescribed and illustrated in our previous paper (De Lotto, 1957) has to be understood as a synonym of *P. transvaalensis* Brain.

Pseudococcus trichiliae Brain (= ***Pseudococcus quaesitus*** Brain)

Pseudococcus trichiliae Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 131.

Three slides containing altogether six specimens labelled : " *Pseudococcus trichiliae* Brain ; on *Trichilia* sp.; Durban, Natal ; 27.x.1914 ; paratypes ; B. 51, C.K.B." were seen.

This species is a synonym of *P. quaesitus* which Brain described in the same paper on an earlier page. All paratypes of *trichiliae* are large and very old adult females, stucturally they cannot be differentiated from those of *quaesitus*.

Pseudococcus wachendorfiae Brain

(Text-fig. 17)

Pseudococcus wachendorfiae Brain, 1912, *Ann. ent. Soc. Amer.* **5** : 183.

Two specimens were examined. One was labelled : " *Pseudococcus wachendorfiae* Brain ; paratype ; on *Wachendorfia paniculata ;* Newlands Flats : 3.x.1910 ; 53." The second bore the following data : "*Pseudococcus wachendorfiae* Brain ; on *Wachendorfia paniculata* Lin.; Newlands Flats : 2.x.1910 ; paratype ; 53." Both paratypes were distorted, partly broken and with many body setae missing.

" Ovisac : no definite ovisac was found, although where the adult female was situated a definite white granular patch of waxy secretion was noticed on the plant. Adult female : largest specimen found measured while alive 4·1 mm. long and 1·9 mm. broad. The body was finely covered with granular secretion, white, but segmentation was still conspicuous. Lateral appendages of wax were absent, but a short caudal tuft was generally noticeable." (Brain, *l.c.*).

Mounted specimens elongate elliptical, membranous. Cerarii confined to a single pair on anal lobes, each built up with two strong conical spines, beset by several trilocular pores and a few robust auxiliary setae ; area about the spines not chitinized. Ventral side of each anal lobe provided with a long robust apical seta, longer than those of anal ring ; subapical one much shorter ; no chitinized bar. Multilocular disc pores in three groups on ventral side of last abdominal segments. The number of pores in one specimen was as follows : (vii) 15 ; (viii) 34 ; (ix + x) 26. On

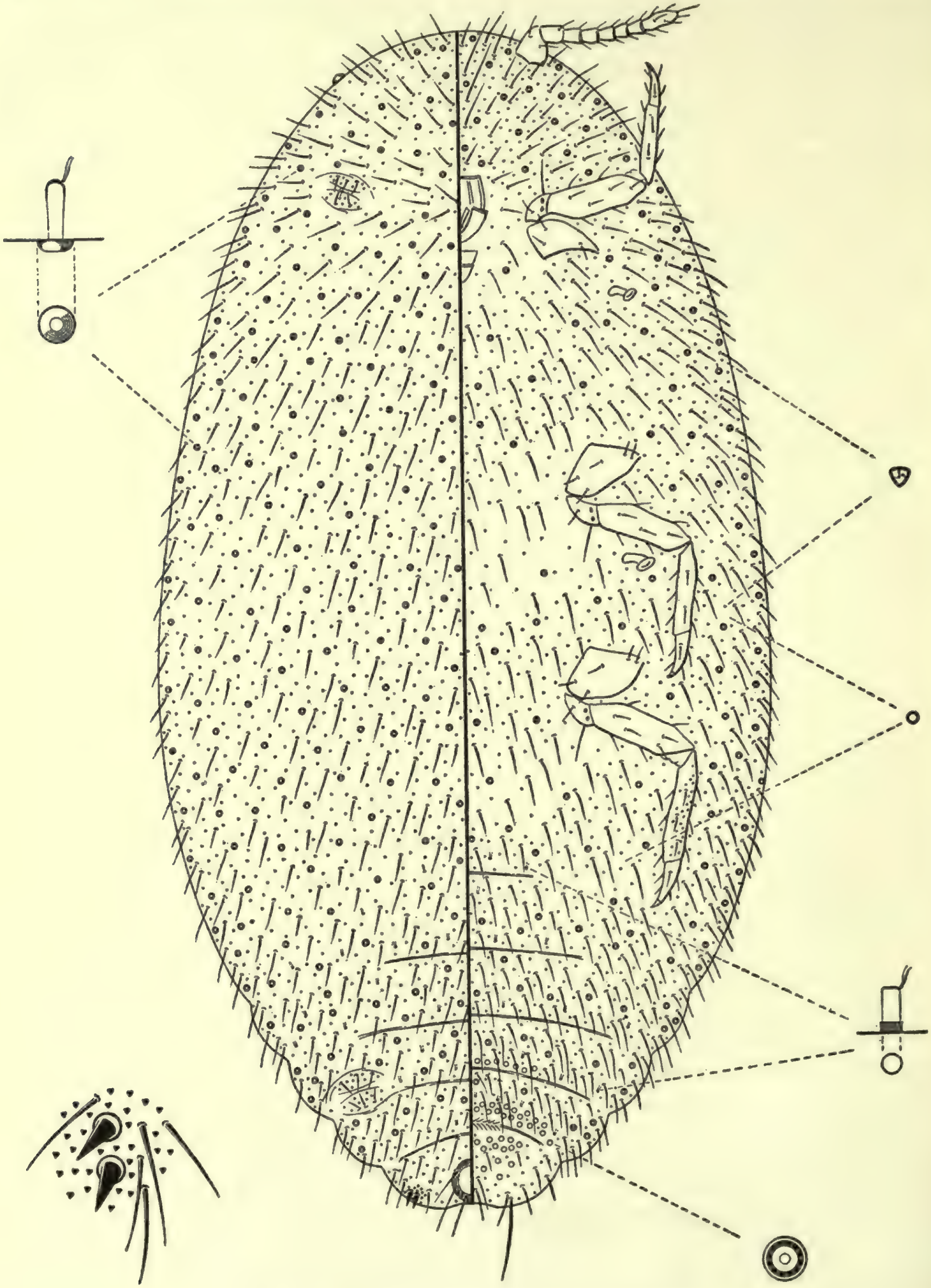

FIG. 17. *Pseudococcus wachendorfiae* Brain

segments anterior to genital opening they are arranged in transverse rows along distal margin. Trilocular pores numerous all over body. Circular disc pores smaller than trilocular pores and abundantly distributed on either side of body. Tubular ducts with oral rim very numerous on dorsum and venter, except on last abdominal segment where they are missing. Tubular ducts with oral collar few on ventral side of abdominal segments only. Dorsal and ventral setae very numerous and unusually long and robust. Anterior and posterior dorsal ostioles rather conspicuous, lips membranous having a cluster of a few trilocular pores and small setae. Circulus absent. Legs well developed ; hind tibiae with numerous small translucent pores. Antennae with eight joints.

Puto (?) africanus Brain

(Text-fig. 18).

Puto (?) *africanus* Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 151.

One slide with two adult females in poor condition being very badly distorted was made available from the U.S. National Collection of Coccidae, Washington, D.C. The slide bore the following label : " *Puto africanus* Brain ; on *Tamarix articulata* ; Cape Town : Jan. 1898 ; paratype ; B. 70, C.K.B."

" Adult female enclosed in a dense felted or papery sac, which is generally white or yellowish in colour . . . The ovisacs, when not deformed by massing together, are regularly elongate oval about 2 mm. long and 1·2 mm. in diameter . . . The adult female as recovered from dry material is merely a black shrivelled mass without indication of secretionary covering of any kind, and without lateral or caudal filaments . . . In mounted specimens the body averages 1·7 mm. in length and 0·9 mm. breadth." (Brain, *l.c.*). Mounted females oval to broadly oval in outline, membranous. Marginal cerarii recognizable only on anal and preanal segments. Anal lobe cerarii each formed by two very robust spines, somewhat lanceolate in shape, surrounded by a loose group of a few trilocular pores and one or two fairly long stout auxiliary setae ; chitinized area large and extending to ventral side. Preanal cerarii each with two spines of same shape and size as those of anal cerarii, beset by a few trilocular pores ; auxiliary setae missing ; area about spines not chitinized. Ventral side of each anal lobe provided with an apparently robust long apical seta[1] and two to four shorter ones. Multilocular disc pores present only on median and submedian ventral areas as far as prothorax, set widely apart from one another. Tubular ducts of two types. One type being rather long and slender without usual collar but the opening being instead surrounded by a small chitinized keel. These ducts occur on both sides of body, apparently without any particular pattern. Other ducts distinctly larger with a narrow rim occurring on dorsum only. Trilocular pores few. Circular disc pores larger than trilocular pores, not numerous and distributed all over body. Dorsal setae not numerous, fairly stout ; a few on abdomen similar in shape and size to cerarian spines ; ventral ones slender. Anterior dorsal ostioles not recognizable on specimens examined ; posterior ones inconspicuous without setae or grouping of trilocular pores on their lips.

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[1] Both missing in the specimens examined.

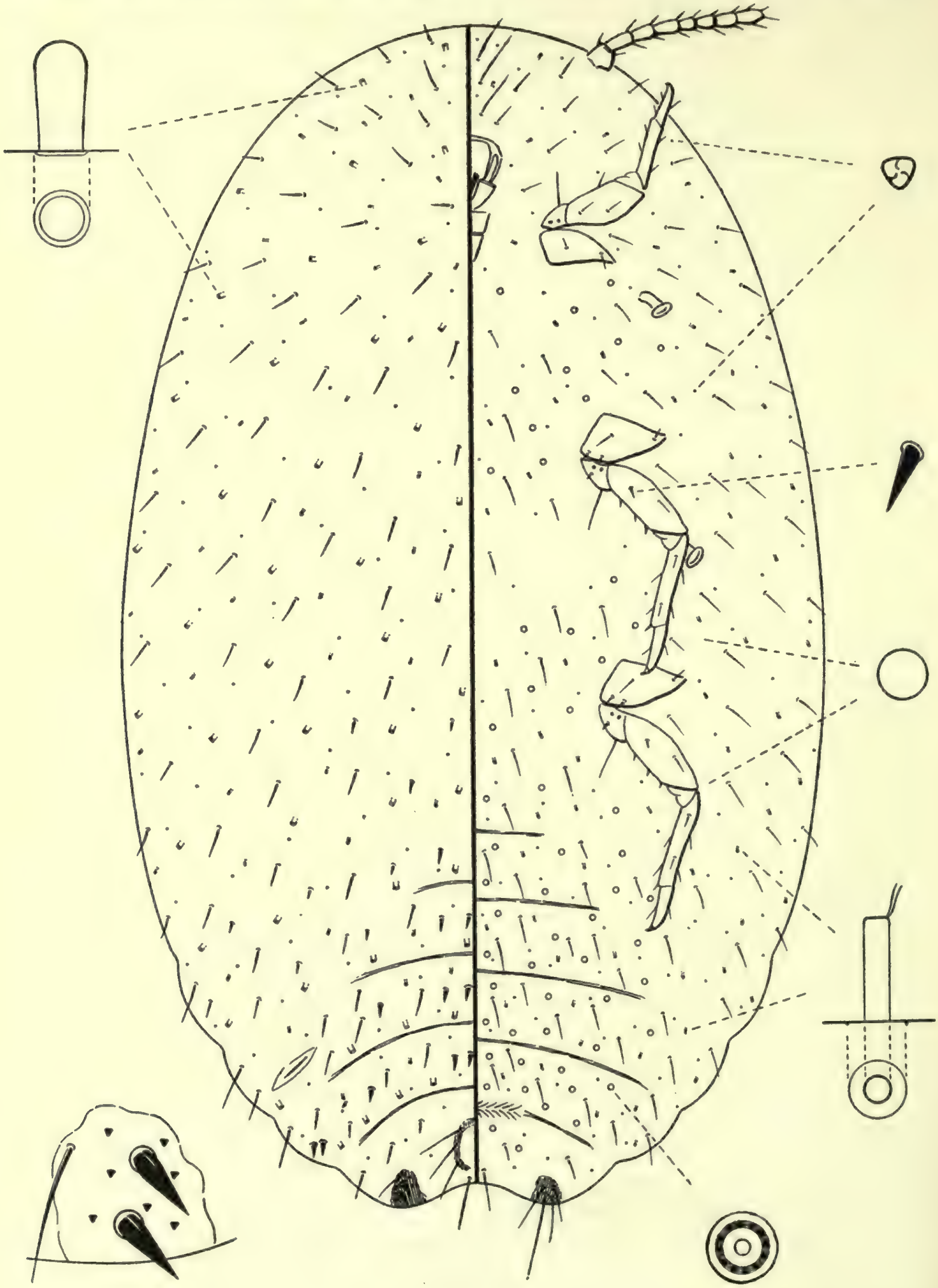

FIG. 18. *Puto africanus* Brain

Circulus absent. Legs normal; claw without denticle; hind legs without translucent pores; a few setae on median and hind legs stoutly spiniform. Anal ring of usual Pseudococcid type, opened posteriorly, with six robust setae.[1] Antennae with eight or nine joints.

Rhizoecus africanus Brain (= ***Rhizoecus falcifer*** Kuenckel)

Rhizoecus africanus Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 89.

Three slides containing altogether seven adult and two preadult females were seen. They were labelled: " *Rhizoecus africanus* Brain; roots of plants; Cape Town: Feb. 1906; paratype; 62."

Brain's paratypes were compared with the redescription and figure of *R. falcifer* Kuenckel recently published by Ferris (1953) and our conclusion fully agrees with Hambleton's opinion (1946) that the Brain species is a synonym of *falcifer*.

Tylococcus chrysocomae Brain

(Text-fig. 19)

Tylococcus chrysocomae Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 93.

The material examined was represented by four slides with altogether eight specimens, all old adults partly distorted, labelled as follows: " *Tylococcus chrysocomae* sp. n.; Grahamstown: 4th March 1915; A. Kelly; on *Chrysocoma tenuifolia*; C.K.B., 61."

" Ovisac: white, dense, elongate oval, may reach 5 mm. long and 2 mm. in diameter. The ovisac may be single or clustered. The adult female is found at one extremity of the ovisac and often appears as though partly enclosed owing to the median dorsal keel of white secretion . . . When cleared, stained, and mounted, the adult female is 2 mm. to 2·5 mm. long." (Brain, *l.c.*). Body of mounted specimens very broadly elliptical, nearly circular; membranous. Margin of body with cerarii reduced to sixteen or seventeen pairs owing to absence of one or two pairs on thorax. Cerarii on head and last abdominal segments tending to be inserted in a small very broadly rounded prominence. All cerarii formed by two to four robust conical spines, without any grouping of trilocular pores or auxiliary setae; area about spines not chitinized. Ventral side of each anal lobe with a stout apical seta about same length as those of anal ring; subapical one much shorter; chitinized bar absent. Multilocular disc pores fairly numerous on either side of body, distributed without any regular pattern. Quinquelocular pores not abundant and scattered on dorsum and venter. Tubular ducts somewhat departing in their structure from those normally found in Pseudococcidae. They are provided neither with oral rim nor oral collar, the opening being instead surrounded by a small circular chitinized keel, similar to those seen in *Puto* (?) *africanus*. They occur abundantly on both sides of body. Trilocular pores few but evenly distributed, circular disc pores apparently absent. Ventral setae rather short and slender; dorsal ones about same

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[1] The two setae posterior to the anal ring actually do not belong to it, as Brain stated. They are the cisanal setae which in this species lie unusually close to the anal ring.

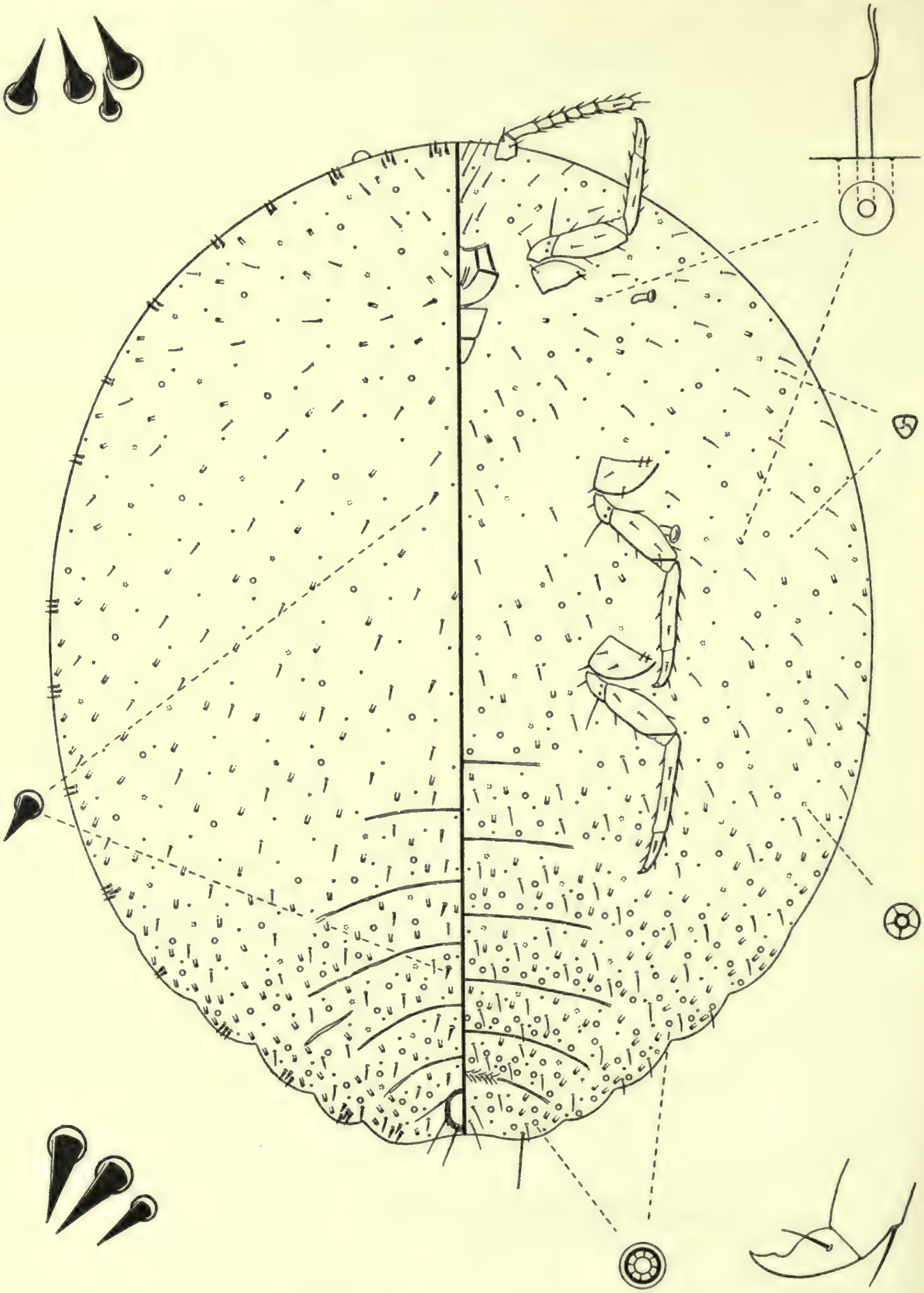

FIG. 19. *Tylococcus chrysocomae* Brain

length but robust ; a couple of stout spines similar to those of marginal cerarii occur on median area of thoracic and abdominal segments. Anterior dorsal ostioles not recognizable ; posterior ones very poorly marked. Circulus absent. Legs well developed, without translucent pores on hind pair ; claw with a small denticle ; ungual and tarsal digitules short and finely pointed. Antennae normally 7-jointed ; but in one specimen one antenna had seven joints, the other eight.

SUMMARY

The author deals with the identity of the Pseudococcidae described from South Africa by C. K. Brain. Twenty-two species are retained as valid and are redescribed or reviewed. Four species and one variety are synonymized in the course of the paper.

ACKNOWLEDGMENTS

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BRITISH MUSEUM NATURAL HISTORY

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DEGEERIELLA FROM THE FALCONIFORMES

THERESA CLAY

BULLETIN OF
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ENTOMOLOGY Vol. 7 No. 4
LONDON: 1958

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British Museum (Natural History)

Pp. 121–207 ; 9 *Plates* ; 164 *Text-figures*

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REVISIONS OF MALLOPHAGA GENERA. *DEGEERIELLA* FROM THE FALCONIFORMES

By THERESA CLAY

INTRODUCTION

BEFORE attempting to define the genus *Degeeriella*, the type species of which parasitizes one of the Falconiformes, it is necessary to consider shortly the whole of the *Degeeriella*-complex.

THE *Degeeriella*-COMPLEX. It is difficult to delimit this group exactly but the following genera should probably be included: *Degeeriella* Neumann (= *Kélerinirmus* Eichler), *Acutifrons* Guimarães, *Austrophilopterus* Ewing, *Capraiella* Conci, *Cotingacola* Carriker, *Cuculicola* Clay & Meinertzhagen, *Lagopecus* Waterston (= *Colinicola* Carriker), *Picicola* Clay & Meinertzhagen (= *Tyrannicola* Carriker), *Trogoninirmus* Eichler, *Upupicola* Clay & Meinertzhagen, a group of undescribed species from the Bucerotidae, and an undescribed species from the Megapodidae, probably an aberrant *Lagopecus*. *Buceronirmus* Hopkins and *Hopkinsiella* Clay & Meinertzhagen should also perhaps be included here. Possible derivatives from this group include *Syrrhaptoecus* Waterston, *Tinamotaecola* Carriker, some of the Ischnocera from the Bucerotidae and also possibly *Penenirmus*. The complex (omitting the doubtful members) can be defined as follows:

Ischnocera with marginal carina of head usually complete dorsally but may be partially interrupted anteriorly, and also partially interrupted each side when a dorsal preantennal suture is present; ventrally it may be complete or interrupted medially. Hyaline margin absent or small, never greatly enlarged and never continuous with hyaline area delimiting a complete dorsal anterior plate. Ventral carina never forms a semicircular band, but is interrupted medially; usually the two carinae pass towards the anterior margin of the head but never form well defined bands continuous with the marginal carina, and only rarely have the strongly sclerotized parallel surfaces to which are attached lobes of the pulvinus as in *Brüelia* (Clay, 1951); pulvinus usually in the form of a single sac-like structure.[1] Ocular seta (except in *Trogoninirmus* and *Austrophilopterus*) and at least two of the temporal

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[1] At one time it was thought possible to use the characters of the ventral carinae and pulvinus to separate the *Degeeriella*- and *Brüelia*-complexes, however the species of *Degeeriella* from *Chelictina* and *Elanoides* have the characters of these structures as in some species of *Brüelia* (see Clay, 1958).

setae elongated. Prothorax with one marginal seta each side (except in *Lagopoecus meinertzhageni* Clay); third episternum fully sclerotized laterally. Abdomen with postspiracular setae on segments III–VII[1] (exceptionally on IV–V only) with sensillae on III or IV–V. Tergal plates entire or separated medially; sternal plates median, lateral or absent. In the male segments IX–X with a single fused tergal plate (entire or divided medially), separated from XI by a suture and setae; anal and genital openings close together on dorsal surface, dorsal part of XI narrowed with the $3 + 3$ anal setae on the dorsal surface of the abdomen (see Clay, 1953). Male genitalia usually with sclerotized penis, short curved parameres, the outer and inner edges of which are continuous with the basal apodeme, and endomeral plate of characteristic form (Pl. 8, fig. 7). This basic form which is found in some species of most of the genera is also found modified to a greater or lesser extent in a few species belonging to many of the genera and in some species the basic degeerielline pattern can no longer be recognized, for instance, there may be an articulation between the parameres and the basal apodeme. The genitalia do not provide good group characters in this complex; these structures in *Acutifrons megalopterus* Carriker and *Degeeriella rufa* (Burmeister) for instance, being more similar to each other than are those of *A. megalopterus* and *A. caracarensis* (Kellogg & Mann); and those of *Capraiella subcuspidata* (Burmeister) are nearer those of *D. fulva* (Giebel) than are those of *D. fulva* and *D. mookerjeei* Clay.

The internal male genitalia are too various, even within one related group (see below, p. 127) to be used as diagnostic characters for the complex, but a general type similar to that of *D. fulva* from *Buteo* (Text-fig. 1) with or without the lateral lobes is found in some of the species of many of the genera; all the species examined with one exception (a *Picicola* from one of the Tyrannidae) have the ductus ejaculatorius long and coiled. An examination has been made of the internal male genitalia of about 150 species belonging to 73 genera of the Ischnocera; it was hoped that the characters of these organs might help in the generic or suprageneric classification of this superfamily. The members of the *Gonides*-complex (including only those found on the Galliformes and Columbidae) have the vesicular apparatus (see further below) formed of two simple lobes, not joined medially and the ductus ejaculatorius modified in some way, they differ in these characters from *Austrogonoides*, *Osculotes*, *Chelopistes* and members of the *Heptapsogaster*-complex. The *Otidoecus*-complex (*Otidoecus*, *Rhynonirmus* and *Cuclotogaster*) have an unpaired diverticulum arising from the ductus ejaculatorius[2]. Apart from these two groups it has not been possible to find characters of generic or suprageneric importance, although they may be of specific or of species group value. Recently Blagoveshtchensky (1956) has published a most useful and extensive account with many figures of the internal genitalia of both Ischnocera and Amblycera.

In the female the genital plate (when present) does not reach to the upper margin of the vulva (cf. *Brüelia*); genital region without lateral spine-like setae (cf. *Rallicola*) or clump of setae on tubercle-like area (cf. *Brüelia*). Inner genital sclerites and subvulval sclerites present (Text-figs. 96, 97). Spermatheca with sclerotized calyx and simple thin-walled sac.

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[1] As in previous publications roman numerals are used for the true segments, see below, p. 126.

[2] The presence of this diverticulum and other characters make it certain that the "*Lipeurus variabilis*" in Strindberg, 1918 : 633 was in fact *Cuclotogaster heterographus* (Nitzsch).

It has not been possible to find any characters separating the females of the *Degeeriella*-complex from those of the *Otidoecus*-complex (i.e. *Cuclotogaster, Otidoecus* and *Rhynonirmus*) except that in the latter the calyx of the spermatheca is never apparent and it has not been possible to find any sign of a spermatheca in dissected specimens (no sections examined). The males are quite distinct : in the *Otidoecus*-complex the genital opening is terminal or ventro-terminal, intertergital sclerites are present and the ductus ejaculatorius has an unpaired diverticulum not yet found elsewhere amongst the Ischnocera.

The present distribution of the *Degeeriella*-complex suggests that an ancestral stock must have been present on birds at an early stage of their evolution and that the Mallophaga have diverged with their hosts. On some host groups there are more than one species group belonging to the *Degeeriella*-complex, these presumably having diverged from each other on the host group in question ; these species groups are either sympatric and probably restricted to different ecological niches on the host, or allopatric and restricted to different taxonomic divisions of the host group. The species belonging to one of these groups have large heads and rounded abdomens with the characters frequently found in this type : that is a dorsal preantennal suture, temporal carinae, pleural thickening less well developed, and the tergites and sternites narrowed or interrupted medially ; the other is the more elongate form as found in *Degeeriella fulva* (Pl. 1, fig. 1). There appears to have been a considerable amount of parallel evolution in the degeerielline stocks resulting in a superficial resemblance between the species groups on different host groups. For instance, an undescribed species of *Lagopoecus* from the Megapodidae, *Acutifrons vierai* Guimarães from the Accipitridae and *Cuculicola acutus* (Rudow) from the Cuculidae all have large heads pointed anteriorly, preantennal dorsal sutures and partial or complete temporal carinae passing posteriorly from the preantennal nodus ; the genitalia are all of the typical degeerielline type or modifications of it. Again *Cuculicola latirostris* from *Cuculus canorus* resembles superficially such species of *Degeeriella* as *D. rufa* from *Falco tinnunculus*, while the *Cuculicola* species from *Geococcyx* resembles *Acutifrons megalopterus* Carriker from a hawk (*Phalcoboenus*) in the broad head and abdomen and the form of the preantennal suture, in both genitalia are of the degeerielline type. In all these cases the species have retained the basic form of the abdominal tergites and sometimes the sternites : the species from the Galliformes have the divided tergal and sternal plates, those from the Falconiformes have the entire tergal and sternal plates, while those from the Cuculidae have the anterior tergal plates at least, divided.

The stability of certain characters and the divergence of the ancestral degeerielline stock on the various host groups together with parallel evolution makes it impossible to define a subfamily for the *Degeeriella*-complex, and further causes great difficulty in generic separation. It is possible with further study based on more material that some of the genera now recognized will have to be re-incorporated in *Degeeriella*.

Degeeriella as found on the Falconiformes is here defined in detail and the characters found throughout the genus will not be repeated in the descriptions of the individual species which follow.

DEGEERIELLA Neumann, 1906

Nirmus. Nitzsch, 1818, *Germar's Mag. Ent.* **3** : 291 (*nec* Hermann, 1804).

Degeeriella. Neumann, 1906, *Bull. Soc. zool. Fr.* **20** : 60. *Nomen novum* for *Nirmus* Nitzsch *nec* Hermann. Type species by subsequent designation, Johnston & Harrison, 1911, *Proc. Linn. Soc. N.S.W.* **36** : 326 : " *D. discocephalus* N."

Kélerinirmus. Eichler, 1940, *Zool. Anz.* **130** : 101. Type species : " *Nirmus fuscus* Nitzsch in Denny."

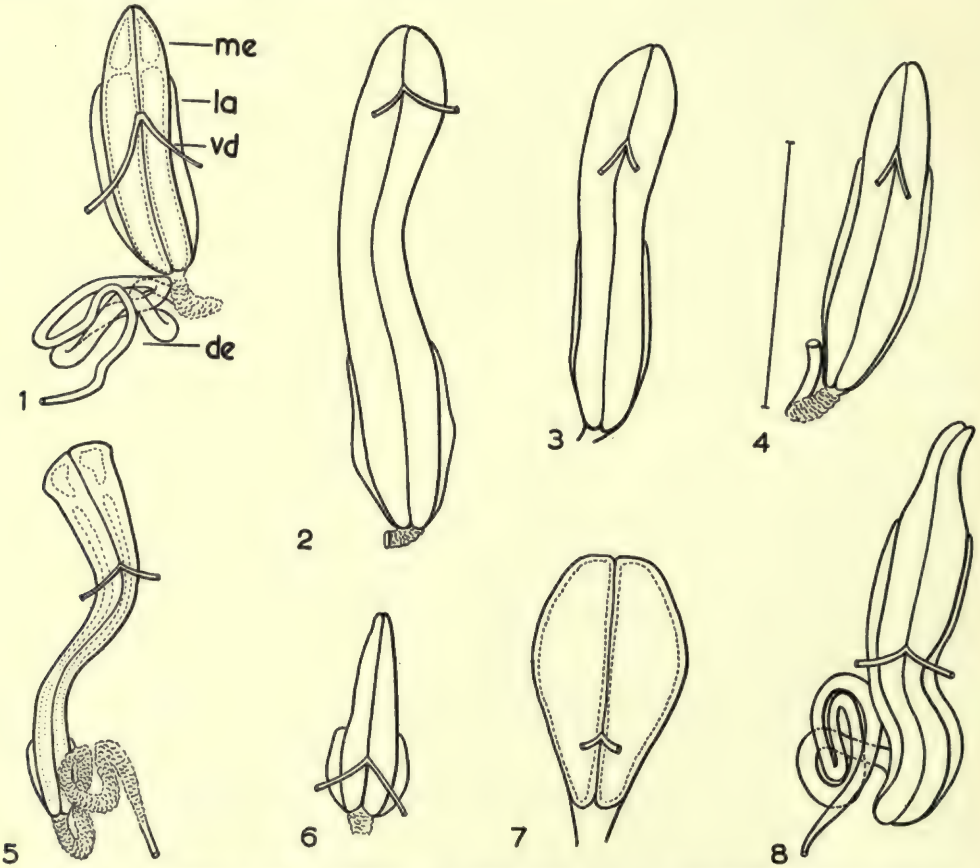
Ischnocera not exceeding 3 mm. in length ; usually without marked sexual dimorphism, but the females average larger. Usually well pigmented species, the colour pattern sometimes forming a taxonomic character. Shape of head various, anterior margin varies from pointed (*D. meinertzhageni*), flattened (*D. fulva*) or rounded (*D. leucopleura*, *D. discocephalus*). Marginal carina entire dorsally ; ventrally may be interrupted medially to a greater or lesser extent ; hyaline margin may be apparent as a narrow rim round the anterior margin of the head. Dorsal preantennal suture and a true dorsal anterior plate never present in adult ; the dorsal preantennal region may have thickened areas or surface sculpturing ; dorsal postantennal sutures rarely present (*D. punctifer*). Ventral carina never forms a complete semicircular band but is interrupted medially and the two carinae pass anteriorly ; at the anterior edge of the pulvinus they merge with the general sclerotization of the head and a ventral suture (the ventral preantennal suture) is carried forward to or near the anterior margin of the head. Pulvinus usually appears as a simple lobe, but in a few species (e.g. *D. guimarãesi*) each ventral carina has a sclerotized flattened part parallel to that of the other carina to which is attached a lobe of the pulvinus (see Clay, 1958). Temporal carinae absent. Mandibles similar throughout the genus ; hypopharyngeal sclerites and gular plate well developed. Male antenna usually similar to that of female, but may show marked sexual dimorphism (*D. mookerjeei*). Chaetotaxy of the head of the basic ischnoceran type (Clay, 1951) ; ocular seta and at least two of the marginal temporal setae each side elongated.

Prothorax similar throughout the group with rounded or parallel lateral margins and straight posterior margin ; one posterolateral or posterior elongated seta each side. Pterothorax may or may not show lateral indication of meso-metathoracic junction ; third episternum fully sclerotized laterally. Sternal plate narrowed anteriorly, normally with three setae each side. Dorsal pterothoracic setae usually comprise two lateral setae, one elongated and one spine-like, and four elongated setae each side of the posterior margin arranged in two pairs ; some species (*D. discocephalus*) may have a greater and more irregular number.

Abdomen with nine apparent segments in the male and eight in the female ; these are interpreted as follows : the first apparent segment, probably I and II fused, is referred to as II, the second to the seventh (the spiracle bearing segments) as III–VIII. In the male the eighth segment represents IX–X fused, the ninth is XI ; in the female the last apparent segment is IX–XI fused. Segment II is always shorter than III. The tergal plates of II–X in the male and II–XI in the female are in the form of single plates across each segment ; tergites II–III may show partial division into two sclerites. The tergite of fused IX–X in the male is usually arched and narrowed medially to a greater or lesser extent and tergal plate XI when present is a single or double sclerite immediately anterior to the anal and genital openings. Kéler (1939) has been followed in considering the dorsal plates as representing the fused tergal and pleural plates. At the lateral edge of these plates of some or all of segments II–VIII there is, in most species of *Degeeriella,* a characteristic internal thickening. This thickening, here called the pleural thickening, usually consists of an internal sclerotized buttress along the edge of each segment which is continued inwards a short way along the inner anterior margin of the dorsal plate ; there is usually a characteristic anterior part passing into the segment above, known as the re-entrant head (Waterston, 1928). Sternal plates II–VI in the form of median sclerites in both sexes ; in the male the terminal sternites form a single fused genital plate. Anal and genital openings of male on dorsal surface of the abdomen with the 3 + 3 anal setae as described above under the definition of the *Degeeriella*-complex. The genital region of the female comprises the genital plate (i.e. sternal plate VII) usually not differing greatly from the anterior plates, but sometimes (*D. rufa*) with a median posterior prolongation. It is not possible to be certain to which segments the remaining sclerites of the genital region belong. Below the genital plate is an uncoloured area of the integument with a sclerite each side, perhaps those of VIII. The integument passes to the vulva and turns in to form the ventral wall of the genital chamber. On this wall are two sclerites, sometimes fused to a greater or lesser extent in the mid-line ; these are perhaps the median sclerites of VIII and are here called the inner genital sclerites (Text-fig. 96, *ig.*). On the dorsal wall of the genital chamber there is a sclerite each side which projects beyond the vulva ; this is perhaps the sclerite of X or IX and X fused and is here called the subvulval sclerite (Text-fig. 97, *sv*). The opening of the spermathecal tube (*os.*) lies between the subvulval sclerites in the dorsal wall of the genital chamber. The spermatheca is a simple thin-walled sac and the calyx is lightly sclerotized.

The external male genitalia (see Clay, 1956) comprise a flattened basal apodeme ; short curved parameres, the outer and inner edges of which are continuous with the basal apodeme without a point of articulation ; an endomeral plate, rather thick dorsoventrally, with diverging dorsal arms (Text-fig. 59, *da.*) which may or may not join the basal apodeme each side and two ventral arms (Text-fig. 52, *va.*) with setae. Centrally there is a sclerotized tube-like penis which usually has at its base an irregular area of sclerotization (shown in the figures by an interrupted line) joined to the basal apodeme by a narrow sclerite (the penial sclerite, *ps.*) ; at this junction there is usually a curved arm each side (the penial arm, *pa.*) bearing a seta (the penial seta, *pst.*). The dorsal and ventral endomeral arms are joined by an area passing ventro-dorsally (and not always visible) to a line of thickening each side of the ventral surface of the plate (Text-fig. 50, *a.*).

Internal male genitalia have been examined from 40 specimens of *Degeeriella* from only 19 species of hosts belonging to the Falconiformes, but even these show considerable variation. In *D. fulva* from *Buteo vulpinus* and *Buteo buteo* these structures conform in general characters to those of *Columbicola columbae* (Linn.) as described by Schmutz (1955). The vesicular apparatus comprises four separate lobes united into a single organ; as in all members of the *Degeeriella*-complex examined the two lateral lobes (Text-fig. 1, *la.*) are shorter than the median lobes (*me*); in some species of *Syrrhaptoecus* however, the lateral lobes are considerably longer than the median ones. Within each median lobe two chambers can be distinguished, the upper containing spermatozoa and the lower what is presumed to be a secretion. Each vas deferens (*vd.*) enters separately into each of the median lobes. The vesicular apparatus is continued into the ductus ejaculatorius (*de.*) which is strongly muscular near its base. The testes and vasa deferentia are similar throughout the complex, and do not differ significantly within any of the Philopteridae examined. Variation of the vesicular apparatus and the ductus ejaculatorius and the point of entry of the vasa deferentia, within the species of *Degeeriella* examined are shown in Text-figs. 1–8.

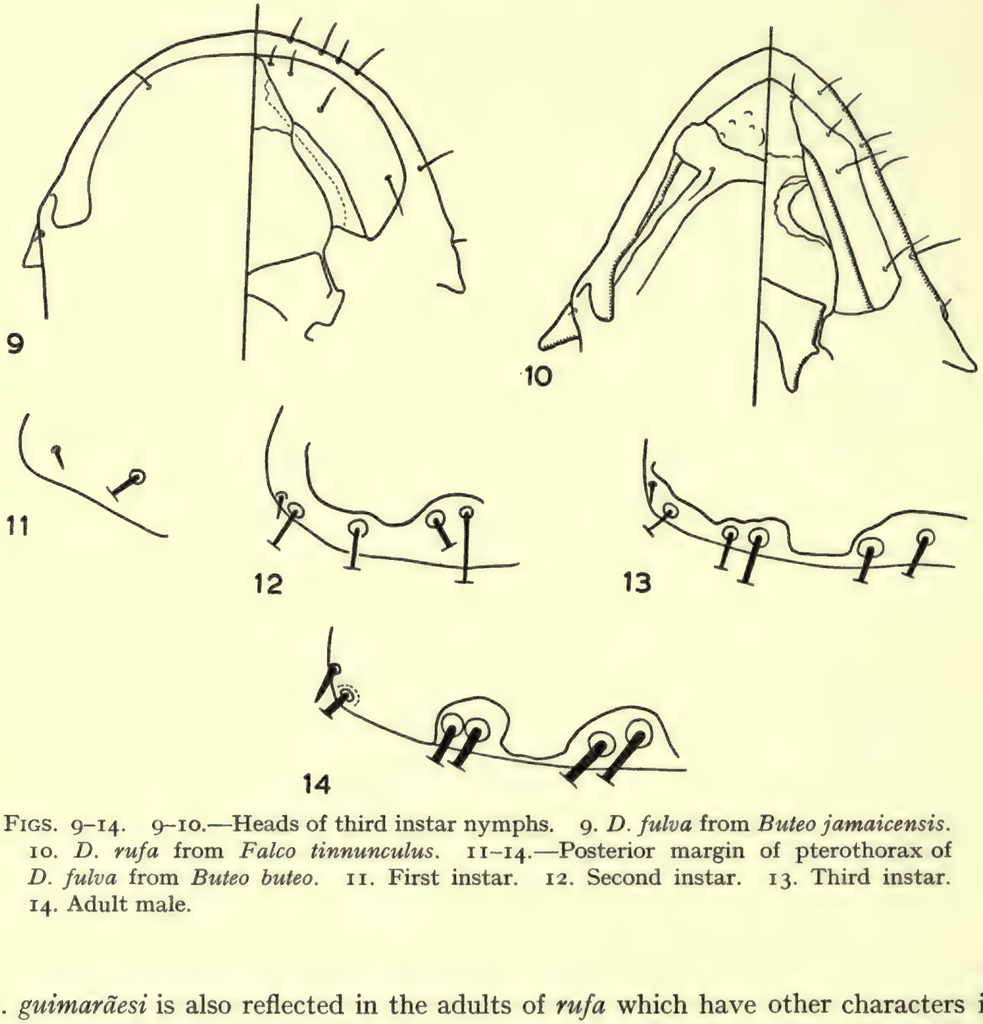


FIGS. 1–8.—Internal male genitalia of *Degeeriella*. 1. *D. fulva* from *Buteo vulpinus*. 2. *D. beaufacies*. 3. *D. fusca* from *Circus aeruginosus*. 4. *D. elani* from *Elanus caeruleus vociferus*. 5. *D. rufa* from *Falco t. rupicolus*. 6. *D. r. regalis* from *Milvus migrans*. 7. *D. mookerjeei* from *Pernis ptilorhyncus gurneyi*. 8. *D. punctifer*. *me.*—median lobe of vesicular apparatus; *la.*—lateral lobe of vesicular apparatus; *vd.*—vas deferens; *de.*—ductus ejaculatorius. Line = 0·5 mm.

The length of the median lobes and the relative size of the lateral lobes may vary considerably in different species; no lateral lobes could be seen in *D. mookerjeei*. In some cases the material was not in sufficiently good condition to distinguish the internal chambers of the median lobes, but there seems no doubt that in both *D. regalis* and *D. mookerjeei* there is only a single chamber, as spermatozoa could be seen filling the whole of the median lobes as figured for "*Lipeurus variabilis*" (?= *Cuclotogaster heterographus*, see footnote on p. 124) by Schmutz (1955 : 303). However, material suitable for sectioning is required before an accurate account can be given of the internal chambers of the median lobes. The ductus ejaculatorius is long and coiled in all species, and in all except *D. rufa* only a short basal portion is strongly muscular, in this latter species this muscular part is carried nearly to the end.

The chaetotaxy of the abdomen has the following features common to all species; the anterior tergal setae of segment II (probably those of the suppressed segment I) are two in number and elongated; postspiracular setae are present on segments III–VII with sensillae on III–V; VIII has the usual lateral seta in a sunken alveolus. All the above setae are omitted from the specific descriptions. Terga II–VIII and sterna II–VI each with a single line of setae; pleural setae present on some or all of segments III–X. Vulva with some spine-like setae and with a varying number of sensilli; posterior to the vulva there are, apart from the three anal setae, a single spine-like seta and one to three elongated setae (the pleural setae of X) each side.

Nymphs. The three nymphal instars are easily separable by the chaetotaxy of the posterodorsal margin of the pterothorax (see Clay, 1955), as shown in Text-figs. 11–14; the third instar has the setae arranged as in the adult but at least two of the setae are thinner. The head does not take on the full adult characters until after the final moult. Boetticher & Eichler (1954) have shown the differences between the shape of the preantennal region of the head in nymphs and adults in *Degeeriella* and based some of their phylogenetic deductions on these findings. The present study of *Degeeriella* nymphs from 24 species of hawks shows that the curvature of the anterior margin of the head may be approximately the same in nymph and adult as in *D. punctifer* and *D. discocephalus*; may be more rounded in the nymph as in *D. fulva* (Text-figs. 15–17) or more pointed as in *D. rufa* (Text-figs. 18–20). In *D. rufa* the anterior margin of the first instar (Text-fig. 18) resembles that of *D. fulva* to a greater extent than do those of the second or third instars (Text-figs. 19–20). The ventral carinae are sometimes better defined in the nymph than in the adult and in those of *D. rufa* (Text-fig. 10) there is a definite inner projection to which is attached a lobe of the pulvinus as in the nymphs and adults of *D. guimarãesi*; thus *D. rufa* resembles this latter species to a greater extent in the nymph than in the adult (see Clay, 1958). The second and third instars of *D. rufa* have a semicircular anterior dorsal thickening and a preantennal dorsal suture with a partial lateral break in the marginal carina each side (Text-fig. 10); these characters are not visible in the adults. In some species e.g. *D. nisus frater* both nymphs and adults have a similar dorsal anterior thickening. There may be considerable differences between the nymphs of two species: thus, although *D. rufa* and *D. fulva* are superficially rather similar the nymphs of each are markedly different (Text-figs. 9, 10). These differences are also reflected in the adults in the characters of the male genitalia, female genital region and chaetotaxy of the abdomen. *D. discocephalus* and *D. fulva* superficially distinct have rather similar nymphs. The greater similarity of the head of *rufa* in the nymphs than in the adult to that of the adults and nymphs of *D. guimarãesi* is also reflected in the adults of *rufa* which have other characters in common with *guimarãesi* not found elsewhere amongst the *Degeeriella*. Populations within a species may also differ from each other to a greater extent in the nymphal than in the adult stage: the third instars of *D. rufa*, for instance, from *Falco rusticolus candicans* and *F. r. islandus* (Text-figs. 21, 22) are more different than are the adults, which in some specimens are hardly separable (figs. 143, 147). This suggests that the superficial similarity of the majority of the species of *Degeeriella* on the Falconiformes is a secondary adaptation to the environment found on this group of birds



FIGS. 9–14. 9–10.—Heads of third instar nymphs. 9. *D. fulva* from *Buteo jamaicensis*. 10. *D. rufa* from *Falco tinnunculus*. 11–14.—Posterior margin of pterothorax of *D. fulva* from *Buteo buteo*. 11. First instar. 12. Second instar. 13. Third instar. 14. Adult male.

and that the characters of the nymphs may be useful in the elucidation of relationships within the genus. Some of the difficulties of understanding these relationships are mentioned below under Host Relationships.

Apart from the species of the *Degeeriella*-complex found on the Falconiformes there are two other groups which have been given generic status, but fall within the definition of *Degeeriella* as given above, these are *Capraiella* and part of *Picicola.*

Capraiella Conci, 1941. This genus was erected for *Nirmus subcuspidatus* Burmeister from *Coracias garrulus* mainly on the character of the pointed head. As will be seen below some *Degeeriella* from the hawks also have heads pointed anteriorly. It has not been possible to find any characters on which *subcuspidata* can be separated from *Degeeriella,* in fact the male genitalia considered alone would place this species near *D. fulva.* It is doubtful, therefore, whether *Capraiella* can be kept as a separate genus but further species may be found on other members of Coraciidae which may throw more light on the relationships of this group.

Picicola Clay & Meinertzhagen, 1938, and the subgenus *Tyrannicola* Carriker, 1956. This genus contains species found on the Pici and the Passeriformes, some of which can be included in the definitions of *Degeeriella* as given below. The species may lack the preantennal suture and have the tergites entire as in *Degeeriella sens. str.*, or may have a preantennal suture and divided tergal plates as in *Cuculicola.* The genitalia may be of the type found in *D. fulva* or a modification of this. These differences cut across the host divisions; for instance, the species from *Geocolaptes* and *Thripias* belonging to the Pici and those from *Colonia* and *Sayornis* belonging to the Passeriformes have the tergites entire; in the two former species the male genitalia are of the *D. fulva* type. The species from *Dendrocopus* (Pici) and *Pitta* (Passeriformes) have the tergites divided; the latter species has the genitalia of the *D. fulva* type, the former the modified form. The species found on the Pici are in general less heavily sclerotized than those found on the Passeriformes and Falconiformes. It is doubtful whether the erection of numerous subgenera is the best solution of this problem.

Within the species of the *Degeeriella*-complex found on the Falconiformes three genera have been erected: *Degeeriella* Neumann, 1906 type species *Nirmus discocephalus* Burmeister; *Kélerinirmus* Eichler, 1940, type species *Nirmus fuscus* Denny , and *Acutifrons* Guimarães, 1942, type species *A. vierai* Guimarães. *Kélerinirmus* was described to include the species with elongate heads and abdomen and to separate them from the species with round heads and abdomens represented by *D. discocephalus,* the type species of *Degeeriella.* This division, however, appears to be a purely artificial one and places together *D. discocephalus* and *punctifer* purely on shape of head and abdomen together with certain characters directly correlated with this shape and of little phylogenetic importance (Clay, 1951). In fact, the characters of the carinae and sutures of the head, the male genitalia and female genital region show that these two species are not closely related. It appears that the *discocephalus* group and *fulva* group of species, both found on the same host groups, are nearly related to each other and perhaps derived from a common ancestor on these host groups. These two species groups are for instance, more closely related to each other than either is to *rufa* in spite of the superficial similarity of *rufa* and *fulva*. Thus, it is not possible to recognize *Kélerinirmus* as a generic division of *Degeeriella*. Carriker (1956 : 114)[1] suggests the possibility that *Acutifrons* should be included in the *discocephalus* group of *Degeeriella*, but here again the similarity is purely superficial and it is unlikely that the *Acutifrons* group of species are particularly nearly related to *discocephalus*. It is possible that *Acutifrons* is not a monophyletic group, the characters distinguishing the species ; the anterior dorsal suture, the temporal carinae and the enlarged head and abdomen having been developed more than once in different but related stocks. Until more is known about the distribution of these species *Acutifrons* should probably be maintained as a distinct genus.

Nirmus splendidus Kellogg, 1899. While agreeing with Carriker (1956 : 126) that the identity of this species must await the examination of the types, the description and figure are those of a *Cuculicola* not *Acutifrons*. No known species belonging to the *Degeeriella*-complex from hawks have the abdominal tergites divided medially, a character which is found throughout *Cuculicola*, further, the figure, except for the lateral margins of the temples represents the species found on *Geococcyx californiensis*. Since writing this, Carriker (1957) has been seen in which a figure is given of the male genitalia of a paratype of *Nirmus splendidus*, this seems to represent those of the species from *Geococcyx californiensis* in a somewhat compressed condition, as usually seen within the specimen. There seems little doubt that this is the true host of *Nirmus splendidus* Kellogg as figured originally by Kellogg (1899) and recently by Carriker (1957), and that the species should be included in *Cuculicola*.

THE SPECIES, SUBSPECIES AND LOCAL POPULATION. In *Degeeriella* there is the difficulty, as always in the case of a widely-distributed homogenous group, of deciding whether any given form should be considered as a species or subspecies or whether some merit taxonomic rank at all. As Mayr (1951 : 93) has said, the subspecies is primarily a taxonomic concept which cannot be delimited from the local population on one hand and the species on the other. In the Mallophaga the application of the subspecific concept has been most haphazard and practically no attention has been paid to the amount of variability within populations from the same host form, and it seems that the time has come to consider this problem as a whole and to try to get some conformity within the suborder.

In the distribution of the Mallophaga it is usual for an order or suborder of birds to be parasitized throughout by the same genus (or genera) of Mallophaga. The populations[2] of this genus on the different species of birds may be apparently indistinguishable, only statistically distinguishable, or may comprise individuals which are slightly but constantly different, or which are markedly different. The present distribution and relationships of the mallophagan genera suggest that these allopatric populations have, in general, been separated from each other by the splitting and species formation of the host stock and are thus analogous to populations of free-living animals on a group of continental islands which have been isolated by the disappearance of land connections (Clay, 1949). As in the case of such populations of free-living animals each of the mallophagan populations is an isolated unit without zones of contact with any other populations. Thus, as with all isolated allopatric populations where there is no evidence available on the degree of reproductive isolation, there are no criteria for separating the polytypic species from the super-species except morphological ones. As these populations are obviously allopatric replacements of each other on the different host group it might be possible in many cases to consider them as belonging to one polytypic species. But this is to ignore the morphological evidence and obscures the fact that while some show marked morphological differences others are hardly separable taxonomically. Further, some distinct populations may each have a number of related morphologically similar

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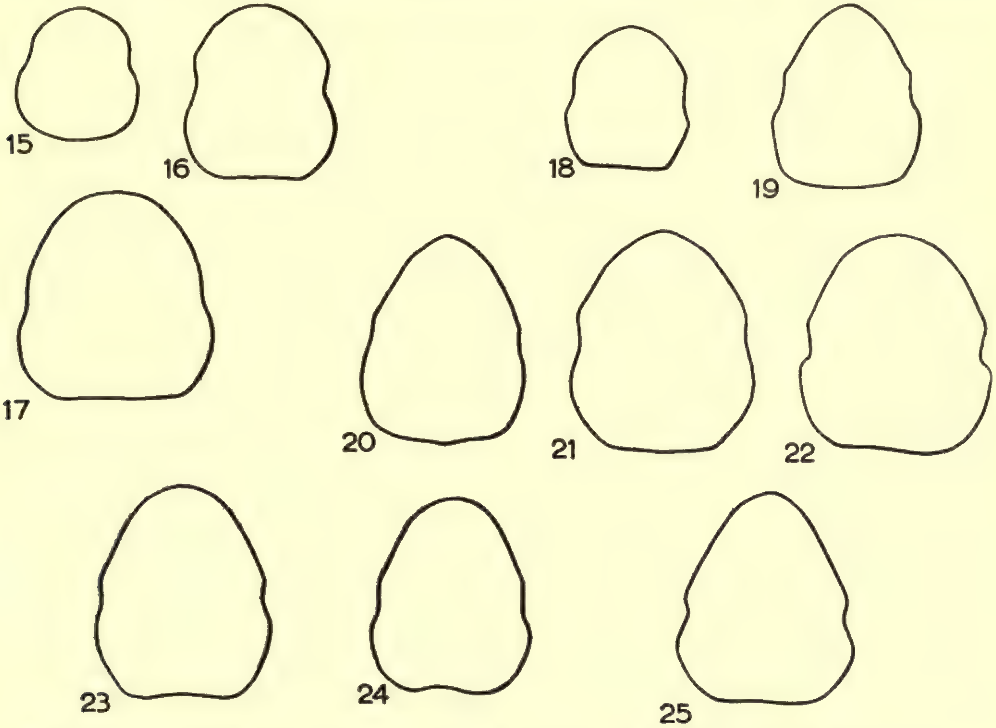
[1] I should like to draw attention to a misquotation in this paper ; on p. 114 it is stated that I use the shape of the abdomen as the principle generic character of *Oxylipeurus* ; I have never considered shape of either abdomen or head as of any phylogenetic importance and as the whole of the passage to which Mr. Carriker refers was an attempt to demonstrate the dangers of using shape as a generic character in the Mallophaga it is apparent that Mr. Carriker has misunderstood what I was attempting to say, as is also shown by his remarks on p. 115, paragraph three.

[2] The word population is here used for all the individuals of a taxa of Mallophaga found on one host form which can potentially interbreed because their hosts are potentially capable of interbreeding. Thus, all the *Degeeriella* from *Buteo b. buteo* throughout its range would be considered as comprising one population.



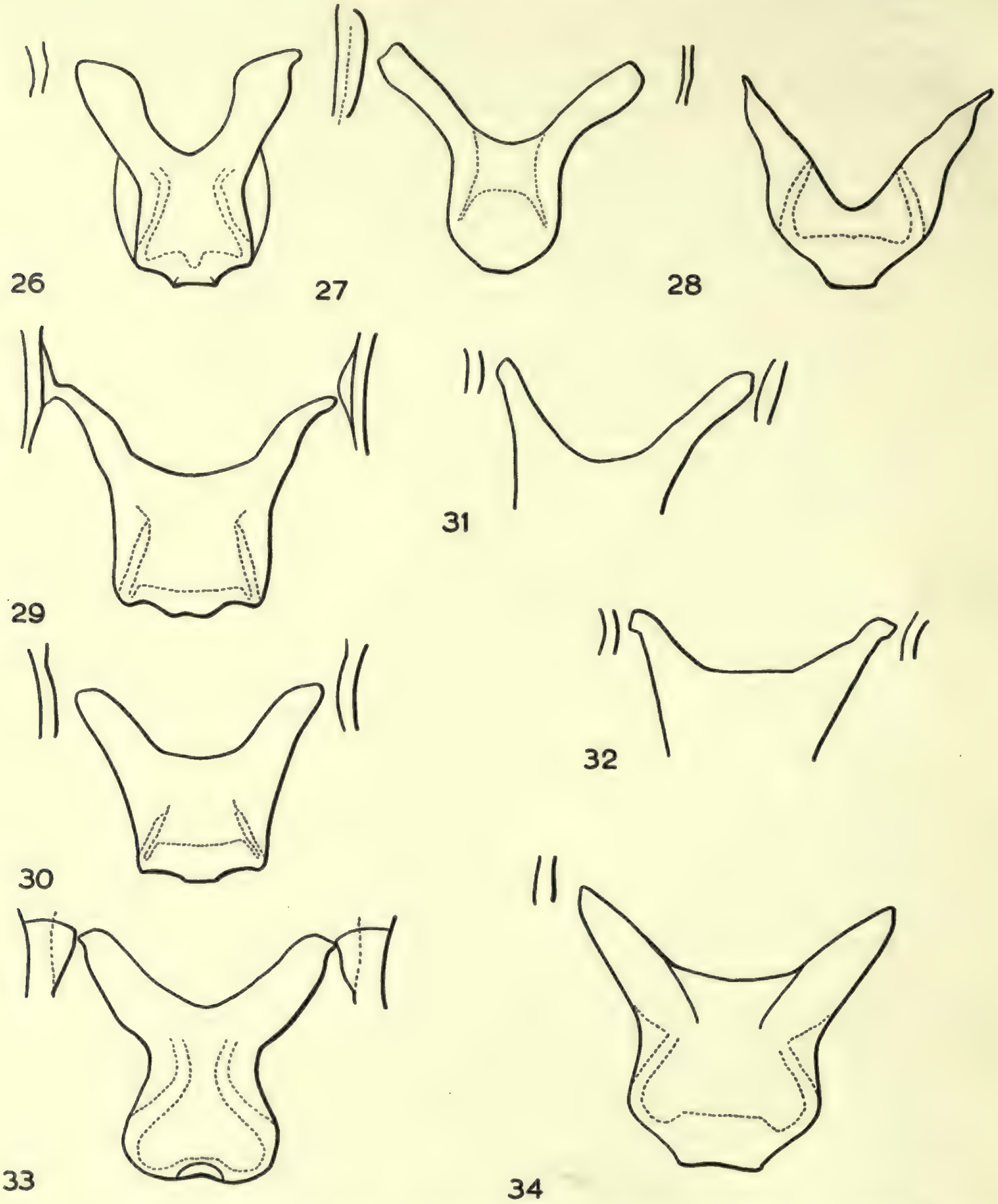
Figs. 15–25.—Heads of nymphs. 15–17.—*D. fulva* from *Buteo buteo*. 15. First instar. 16. Second instar. 17. Third instar. 18–20.—*D. rufa* from *Falco tinnunculus*. 18. First instar. 19. Second instar. 20. Third instar. 21. Third instar *D. rufa* from *Falco rusticolus islandus*. 22. Third instar *D. rufa* from *Falco rusticolus candicans*. 23. Third instar *D. beaufacies*. 24. Third instar *D. n. nisus* frim *Accipiter nisus*. 25. Third instar *D. n. frater* from *Accipiter badius*, Thailand.

populations, making it more convenient to call each of these population groups, a species divided into a number of subspecies.

It seems probable that there have been two tendencies in the evolution of the Mallophaga. One was to speciate rather rapidly, perhaps due to the original occupation of an empty ecological niche provided by the feathered bodies of birds, a changing environment due to the evolution of the birds themselves, together with the increasing isolation of the populations of the Mallophaga. The second tendency was a conservatism due to the later similarity of the environments afforded by birds belonging to one group, and to the close adaptation to a host which results from the parasitic habit and perhaps limits subsequent morphological change. The first tendency was probably responsible for the formation, in the Ischnocera, of the large number of genera and distinctive species groups, while the second has led to the similarity of the forms comprising these groups. The uniform environment and the necessity of being able to move easily through the feathers has probably been responsible for the relatively smooth uniform surface of the Mallophaga without the development of feathered setae, scales and other modifications of the exoskeleton which provide useful taxonomic characters in many groups of insects. It is rather frequent in the genera of the Ischnocera to find a series of populations superficially similar and differing mainly in the characters of the male genitalia, the uniformity of the environment having led to superficial similarity and the isolation of the populations being shown in differences in such non-adaptive characters as the male genitalia. It must be expected in the Mallophaga that the character differences between related groups will be small, and these must of course be judged for each group of related species ; similar character differences cannot of course be used in separating analogous taxa in the Ischnocera and Amblycera, for instance.

The degree and time of isolation cannot be used to determine the specific or subspecific status of a population : the populations of *Degeeriella* (*D. regalis regalis*) on *Milvus* and on *Buteo galapagoensis* are separated by host and geographical distribution, and although there cannot have been any gene flow between these populations over great periods of time, and although the gene pools must now be distinct, there is no clear cut morphological difference between these populations. If distribution is taken into account there is a further difficulty that the exact relationship between the hosts is not always known, so that on the analogy of the free living allopatric populations the exact position of the locality of any one population in relation to another is uncertain and deductions of which are the most nearly related populations cannot always be made. Thus, although some groups may show gradients in such characters as the size and shape of head and number of abdominal setae these cannot be equated with clinal variation in free-living populations, as the populations are isolated and they have a host (not geographical) distribution, the most similar forms not necessarily being most nearly related. For instance, in *Degeeriella* there are examples of Harrison's law that in related populations those parasitizing the larger hosts tend to comprise larger individuals ; correlated with this increase in size there is a tendency towards larger heads, broader anteriorly, and sometimes to a greater number of abdominal setae. This tendency is seen in some of the populations of *D. rufa* on *Falco*, *D. nisus* on *Accipiter* and *D. fulva* on *Buteo*. Thus, sometimes the similarity of characters is partly due to ecological factors and not relationship (although in some cases of course the former may be dependent on the latter). Some of the subspecies in the Mallophaga differ from each other in only one character or in two or three correlated characters perhaps associated with size differences which are themselves dependent on host size. Thus, there may be populations, not very closely related, which are indistinguishable from each other and must be included in the same subspecies (Mayr, Linsley, Usinger, 1953 : 32) ; these are analogous to the polytopic subspecies of the free-living animal.

It has been suggested (Mayr *et al.*, 1953 : 104) that the morphological differences between sympatric species of the same genus might give an indication of the correct status of isolated populations, but Brown & Wilson (1956 : 49) have shown that when two species of animals overlap geographically the difference between them is accentuated in the zone of sympatry and weakened or lost entirely in parts of their range outside this zone. This might explain the differences between the species of *Degeeriella* (a genus in which sympatry is rare) on *Pernis,* which are so much greater than is usual between species found on hawks belonging to the same genus. The two species, *Pernis apivorus* and *P. ptilorhynchus* might originally have had the same species of *Degeeriella,* the populations of which split into two and diverged sufficiently to remain distinct when they later became sympatric (see Clay, 1949) ; if the fact that that they had become sympatric caused them to diverge to a greater extent and if *D. phlyctopygus* became extinct on *Pernis ptilorhynchus* and *D. mookerjeei* on *P. apivorus,* the differences between these two species of *Degeeriella* would be more marked than if they had not formerly been sympatric. This explanation is partly supported by the fact that these two species are separated by the characters of the male antennae, a common difference between sympatric species of the same genus (Clay, 1949). It is perhaps for this reason that differences between allopatric species are sometimes much smaller than those distinguishing sympatric species. If we accept the definition of subspecies as populations which would interbreed under natural conditions if they occurred sympatrically, then any morphological differences which might prevent interbreeding should be considered as specific characters. It seems reasonable to suppose that at least some of the character differences between closely related sympatric species are those which prevent or discourage cross-breeding. In the Ischnocera closely related sympatric species may be distinguished by the male genitalia, male antennae and in one genus (*Osculotes*) the legs of the male, and in size and proportions of the head and abdomen. The former characters would probably all prevent or discourage cross-breeding, while the last two characters might mean that the populations were partly restricted to different ecological niches on the body of the bird resulting in partial isolation from each other. An example of this in the Anoplura is provided by *Pediculus humanus humanus* and *P. h. capitis,* whose occupation of different ecological niches on man has resulted in impaired fertility when they are crossed (Hopkins, 1949 : 419). Even gross differences in the form of the male genitalia in insects may not form a mechanical bar to successful copulation (Dobzhansky, 1955 : 189). Jordan (1896) in his analysis of the genitalia of *Papilio* showed that in general each of the species was distinguishable by the form of the male genitalia ; he also showed that there was geographical variation



Figs. 26–34. Endomeral plate, dorsal view. 26. *D. fulva* from *Aquila chrysaëtos*. 27. *D. carrikeri*. 28. *D. emersoni*. 29. *D. n. nisus* from *Accipiter n. nisus*. 30. *D. fusca* from *Circus aeruginosus*. 31–32.—*D. n. frater* from *Accipiter badius*, Thailand; 2 specimens from the same host individual to show variation. 33. *D. hopkinsi*. 34. *D. leucopleura*.

in the structure of the male genitalia and concluded that it was not possible to draw a distinction between specific and subspecific characters and that a peculiarity of a structure might be an individual aberration, a subspecific or a specific character. Jordan did, however, believe that divergence in the organs of copulation was a means of preventing intercrossing. Within the Mallophaga the genitalia may be uniform, with only minor or no apparent differences throughout genera, or large species-groups, examples of this are found mainly in the Amblycera (e.g. *Colpocephalum* and *Actornithophilus*), and in some Ischnocera (e.g. *Anaticola*) ; in others there may be relatively small but constant differences in the population from nearly every host species, as in some groups of *Quadraceps*, and in other genera the differences may be so great that it is difficult to homologize the sclerites forming the genitalia of the different species. It must, therefore be presumed that the differentiation of the genitalia has taken place at different rates in different groups and that similarity of genitalia cannot always be used as a criterion of conspecificity, this is especially so in some genera of *Amblycera.* In *Anaticola* again, where the genitalia are similar throughout the genus it would seem to be necessary to use the characters of the preantennal region of the head for specific divisions. It is clear therefore, that the delimination of the specific and subspecific categories in the Mallophaga must be based on criteria which differ in each genus and that a study of the whole genus is necessary before a decision on these categories is made. Moreover, it is necessary to choose completely arbitrary criteria for the decision as to whether a population should have specific or subspecific rank, and this, in spite of some of the criticisms mentioned above, must be based on the characters of the genus as a whole, the number of character differences present, the characters separating sympatric species of the same genus and to a lesser degree host distribution.

It is apparent that the male genitalia of the *Degeeriella*-complex (see above p. 124) are rather constant in character, those of *Capraiella,* for instance, being quite near the *fulva* group of species, and that small differences in these structures may therefore be of significance in distinguishing species. A population has been considered as a full species if the individuals comprising it show one of the following qualifications :

1. Male genitalia quite distinct.

2. Male genitalia differ to a lesser extent, sometimes to a rather minor degree, but there are also a number of other character differences, such as the presence or absence of the pleural setae on certain of the abdominal segments, 4 or more setae on each of the sterna III-VI, together with other morphological characters such as the form of the pleural thickening, marginal carina and ventral suture of the head, and marked differences in the shape of the nymphal heads.

3. Male genitalia apparently indistinguishable but the individuals differ in many of the other characters listed above.

Populations are treated as subspecies when the male genitalia are apparently identical or only differ to a minor degree (e.g. number of setae as in *D. rufa caruthi*), which differ in the shape and proportions of the head and in a minor way in the breadth of the temporal marginal carinae and pleural thickenings or the shape of various sclerites.

The second, and more controversial problem is that of deciding whether certain populations should be recognized taxonomically at all. Various procedures have been adopted within the classification of the Mallophaga, one is to describe as new every population occurring on a different host species, in the hope, it is presumed, that 50% or more may prove to be valid and leaving some other worker to find out. Another method is to take single specimens and to describe them as new species or subspecies on some minor character which is likely to be variable within the population or even an artefact due to method of preservation and of no taxonomic significance. These two examples of bad taxonomic procedure, unfortunately still rather frequent in the systematics of the Mallophaga, need not be further considered. The difficult cases are those where there are differences and where the populations must be genetically quite distinct, but it is considered unsatisfactory to recognize them taxonomically. In *Degeeriella* it is possible to distinguish three categories, apart from those where insufficient material is available, the taxonomic recognition of which it is considered would not assist in the classification of the group :

1. Certain populations are only separable from each other statistically ; here no useful purpose would be served in naming these microsubspecies, where many individuals would not be identifiable.

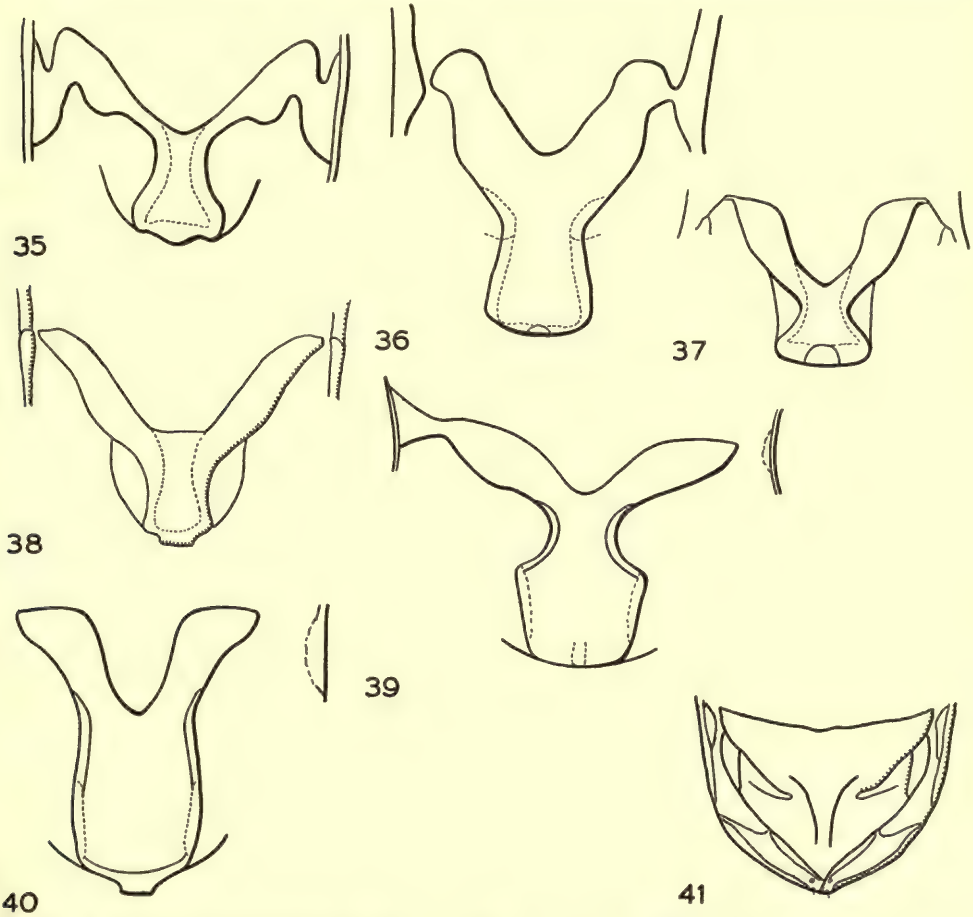
2. Certain populations may appear to differ, but when large series are examined too much variation is found to support the divisions, an example of this are the populations from *Aquila* and the various species of *Buteo* (see p. 146).

3. The populations from two hosts may be distinctly separable on such characters as size and shape of head, but if between these two there is a series of populations from related hosts showing a character gradient in these characters it is not considered that any of the populations should be recognized. The populations of *D. rufa* from *Falco* provide a particularly difficult problem (see further p. 183) as they differ from each other in the outline of the anterior margin of the head, showing all degrees from marked differences to very slight ones, the latter being complicated by individual variation. If any subspecies are recognized then the classification of the populations showing minor differences becomes almost impossible ; this may be a case where subspecies should not be recognized.

This policy of not overwhelming the classification by naming every statistically or barely separable population is not to discourage the study of populations, their variation and host distribution ; there is much interesting information on these subjects to be gathered from detailed statistical analysis, all that is here recommended is that these populations should not be given names. In this present paper an attempt has been made to sort out the populations deserving taxonomic rank and not to study detailed variation.

VARIATION AND ARTEFACTS. The populations of *Degeeriella* from the various hawks are frequently very similar to each other and forms are separated on rather slight character differences, for this reason it is necessary to consider the amount of variation within populations from one host form. Further, it is necessary to work with specimens which have been treated in various ways so that they can be examined under high-power microscopes and this may cause various artefacts dependent on the methods used. Individuals in populations of Mallophaga, unlike some other groups of insects, tend to show little variation in size and external characters, due no doubt to the similarity of the environment in all stages of development and to the unlimited and easily accessible food supply. The reliability of the morphological characters which have been used in the taxonomy of the group are discussed below.

1. *Size.* As already mentioned populations of Mallophaga tend to be rather constant in size. A number of experiments were carried out to see which was the most reliable measurement in *Degeeriella*. A male and female of each of *D. fuva*, *D. r. regalis* and *D. rufa* were measured at each stage of the following treatments :



Figs. 35–41. Endomeral plate, dorsal view. 35. *D. d. discocephalus*. 36. *D. elani*. 37. *D. tendeiroi*. 38. *D. rufa* from *Falco tinnunculus*. 39. *D. r. regalis* from *Milvus milvus*. 40. *D. r. deignani*. 41. *D. punctifer*.

(*a*) In 80% alcohol after two to three years storage ; (*b*) in a saturated solution of phenol in 70% alcohol, warmed to clear ; (*c*) after 22 hours in cold 10% caustic potash, body contents removed, cleared in clove oil and mounted in canada balsam ; (*d*) after immersion for 15 minutes in 10% caustic potash in a boiling water bath, mounted in canada balsam and the cover glass pressed well down. It was found the breadth of the temples remained either constant under the different treatments or changed no more than 0·004 mm., while other measurements especially total length, breadth of pterothorax and length and breadth of abdomen were rather variable due to contraction or expansion between the different regions of the body or changes in shape due to pressure by the cover slip. This means that in *Degeeriella* the breadth of the head is a measurement that can be taken quickly and accurately in any media, does not alter with the age of the adult, the abdomen for example in teneral females is usually smaller (Clay, 1956) and it is possible to compare the measurements of other workers as there is no ambiguity about the exact position of where the measurement is taken. The whole of the collected populations from one bird can be measured in phenol solution without the labour of mounting them in canada balsam and ensures that not only the larger specimens, which consciously or unconsciously are likely to be picked out for permanent mounts, are measured. This measurement, therefore, is useful in comparing populations from various hosts which differ only in absolute size; the size of the temple breadth being roughly proportional to the total size. It cannot of course be used in comparisons of populations which differ in the shape of the postantennal region of the head. It should be noted that this is a different problem from the consideration of which measurements show the least variation in a population from one host where all individuals have been treated in the same way. Tjønneland (1955) compiled the variation coefficients for various measurements of 40 males and 40 females of *Degeeriella d. aquilarum* Eichler taken from the same host individual and subjected to the same treatment; it was found that the measurement of the head showed the least variation within the populations. It has been found in numbers of specimens belonging to one species that those from the different hosts may differ in average measurements of head breadth, but that the ranges overlap; it is important therefore to give the range and number of specimens measured. For reasons discussed elsewhere (p. 138) time has not been spent on statistical analysis of the measurements of the different populations of *Degeeriella* mentioned in this paper. It is doubtful whether subspecies should be recognized on size differences alone and certainly not when only two or three specimens are available.

2. *Pigment and sclerotization.* As it is frequently necessary to work with material which has been kept long in alcohol or over treated with caustic potash it is difficult to use the characters in the comparison of all species. However, the amount and arrangements of pigment may be a taxonomic character (see *D. fusca*). The sclerotized plates may vary in outline as some of these, especially the thoracic sternal plates and the male and female genital plates, may have part of the plate more lightly sclerotized and in some specimens, either naturally or due to treatment, the lighter part is not apparent, thus altering the outline.

3. *Head.* The shape and size of the head is a useful character and as shown above the breadth is not affected by the various methods of preparation. However, in some populations there appears to be a certain amount of variation in the curvature of the anterior margin (see under *D. fulva*). The thickness of the marginal carina and the presence or absence of an inner median indentation are usually reliable characters, but there may be intrapopulation variation in these characters, sometimes due to methods of preparation; teneral specimens especially may be misleading in

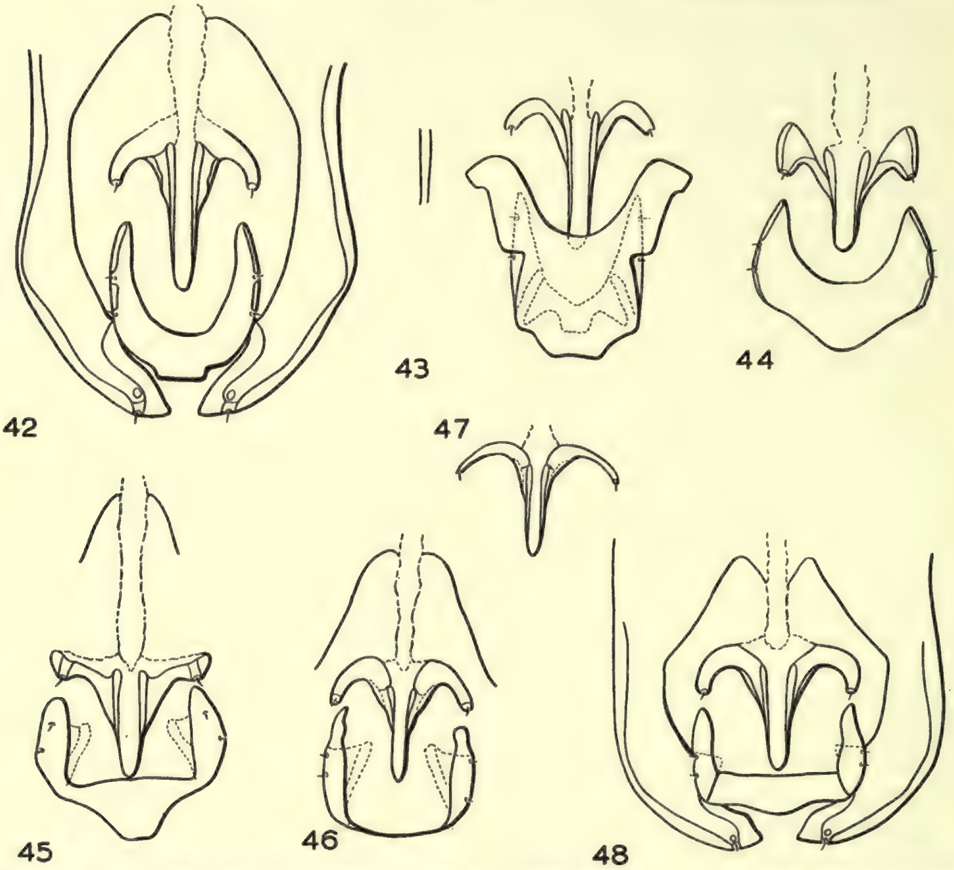
these characters (see below under *D. pseudophaea*). Thus, specimens of the *fulva*-group from the same host form may have the typical flattened anterior margin, with broad marginal carina and well marked inner marginal indentation, whereas other specimens may have rather rounded anterior margins, rather narrow marginal carina and the inner marginal indentation not apparent. Specimens which have been left too long in caustic potash may have the marginal carina appearing narrower, the head often more rounded anteriorly and the anterior end of the ventral suture not distinguishable; the extent of the hyaline margin may also vary in mounted specimens according to the position and pressure exerted. The proportions of the head, that is ratio of length of preantennal region to postantennal region and ratio of breadth to length of these regions may be misleading as these show variation within populations. Reduction of these proportions to mathematical terms is unsatisfactory owing to the difficulty of finding exact points of measurement and a more accurate method is that described in Clay & Hopkins (1954 : 230) in which an outline of a head is drawn with a camera lucida and comparisons of other heads made by projecting them on to this outline ; by adjusting the magnification it is possible to get a fixed measurement such as the breadth of the temples and thus compare the proportions of the head (see also p. 184). If this is done with a large number of specimens from one host it will be seen that proportions are often variable and cannot be used for subspecific divisions. Both the marginal and temporal marginal carinae may have indentations, the number, shape and position of which show some individual variation. However, the thickness and outline of these carinae, with the reservations discussed above, may be of taxonomic importance. The conus tends to be variable in shape and length mainly due to the position in mounting and except where the differences are strongly marked (e.g. *D. punctifer*), this structure has not been used as a taxonomic character. The position of the second ventral submarginal seta (Clay, 1951) shows individual variation being found either above or below the level of the inner margin of the marginal carina.

4. *Thorax.* The number of sternal setae and the shape of the sternal plate show individual variation (Text-figs. 112–118). and is of no taxonomic value amongst nearly related species. There are usually eight elongated posterodorsal setae on the pterothorax arranged in two groups of two each side, but there may be individual variation in the number and position.

5. *Abdomen.* In general the presence or absence of a partial division of tergal plate II–III is constant for a given taxa, but there are cases where this character especially in II shows individual variation. The width and the dorsal and ventral outline of the pleural thickening is often a useful character, but in mounted specimens is liable to distortion ; this distortion is particularly marked in the shape and details of the re-entrant head ; teneral specimens do not always show the normal characters of the adult pleural thickening. In the female the subvulval sclerites may show slight individual variation.

6. *Male genitalia.* The basal apodeme may show slight variation in outline either due to individual variation or to distortion in preparation. The shape of the tips of the parameres must again be used with caution as the appearance of these is dependent on position of mounting. The sclerotization round the penial sclerite and penial

arms is irregular and rather variable in outline. The fusion or not of the dorsal endomeral arms with the basal apodeme may be a specific character or it may show individual variation and differ on the two sides of the same individual. There is also frequently considerable variation in the shape and length of the distal ends of the ventral endomeral arms and the position of the setae, the two sides in one individual often being asymmetrical in these characters. It is not always possible to see the relationship of the dorsal and ventral parts of the mesosome to each other unless the genitalia are dissected and mounted separately on the slide.



Figs. 42–48. Male genitalia, ventral view of distal area. 42. *D. fulva* from *Aquila chrysaëtos*. 43. *D. beaufacies*. 44. *D. carrikeri*. 45. *D. emersoni*. 46. *D. n. nisus* from *Accipiter nisus*. 47. *D. n. frater* from *Accipiter badius*, Kenya. 48. *D. fusca* from *Circus aeruginosus*.

7. *Abdominal chaetotaxy*. This frequently forms a useful taxonomic character, but it is important to consider the amount of individual variation. The presence or absence of pleural setae on some of the anterior segments and on X in the male can be used to separate species or species groups, but occasionally an individual will

be found with one seta present on one side of a segment when its absence is characteristic of the species. Another character which can be used to separate species groups is whether the sterna of III–VI normally have 4 or more setae ; however, the species characterized by the presence of 4 setae may have the occasional specimen with one or two segments with 3 or 5 setae. The number of tergal setae may also be taxonomically important but here again there is individual variation and a more useful character is the range in the total number of setae found on segments III–VII. The dorsal setae on segment X of the male may vary from 1–3 each side, but in some populations one each side seems to be the rule with occasional exceptions.

Characters of taxonomic importance. The following characters have been found to be of taxonomic importance in *Degeeriella* and should be given together with their variation in all descriptions of new taxa : Shape of head : form of marginal and ventral carinae, and anterior extension of ventral suture ; thickness of temporal marginal carinae ; number of elongated marginal temporal setae ; presence or absence of postantennal sutures. Form of tergal plates of segments II–III, and XI in male and IX–XI in female ; width, and dorsal and ventral outline, and development of re-entrant head of pleural thickening. Outline of female genital plate, inner genital sclerites and subvulval sclerites. Presence and absence of pleural setae on segments II–VI and of X in male and numbers of sternal setae. The male genitalia should be figured to show the length of the penis and the form of the penial arms, and a dorsal and ventral view of the endomeral plate.

SYSTEMATIC SURVEY OF THE SPECIES OF *DEGEERIELLA* PARASITIC ON THE FALCONIFORMES

For convenience in classification and to avoid frequent repetition in descriptions, the species are divided into a number of species groups. There is naturally not always a clear cut distinction between the species groups and these may not always form natural phylogenetic assemblages. The groups are based mainly on the characters of the head, abdominal chaetotaxy and the male genitalia. Characters given under the definition of the genus (p. 126) and for the species groups are not usually repeated again in the descriptions of the species.

The fulva *Species Group*

1. Head index less than 0·90.
2. Dorsal head sutures not apparent.
3. Two of the marginal temporal setae each side elongated.
4. Thoracic sternal plate and chaetotaxy as in Text-figs. 112–118 ; this plate shows individual variation in shape and in the number of associated setae.
5. Thorax and abdomen with general shape as in Pl. 1, fig. 1.
6. Tergal plates of segment XI not apparent in male.
7. Terga of segments IX–XI in female as in Text-fig. 105.
8. Pleural thickening of segments III–VI usually with well developed re-entrant heads.

9. Sternites of II–VI in the form of quadrilateral median plates.
10. Male genital plate of irregular and variable outline.
11. Female genital plate without median posterior prolongation.
12. Female inner genital sclerites never fused in mid-line.
13. Male genitalia of type shown in Pl. 8, fig. 3 ; penial sclerite present.
14. Setae each side of posterodorsal margin of pterothorax : 1 (lateral) spine-like seta, 1 elongated seta, 2 pairs of elongated setae (as Text-fig. 14).
15. Pleural setae absent on segments II–III and usually IV, and on segment X in male.
16. Sternocentral setae of segments III–IV normally 4.
17. Ventral chaetotaxy of male segments VII–XI as in Text-fig. 102 ; in some specimens one or both of the outer setae on segment VII may be absent.

Degeeriella fulva (Giebel), 1874

Type host : *Aquila chrysaëtos* (Linn.)

(Pl. 1, figs. 1–7 ; Pl. 8, fig. 3 ; Text-figs. 1, 9, 11–17, 26, 42, 70, 84, 102, 105, 109, 112–118)

Nirmus fuscus Nitzsch, 1861, *nec Nirmus fuscus* Denny, 1842. *In* Giebel, *Z. ges. Nat Wiss.* **17** : 525. Host : *Buteo vulgaris* = *Buteo b. buteo* (Linn.).

Nirmus fulvus Giebel, 1874. *Insecta epizoa* : 124. Host : *Aquila fulva* = *A. chrysaëtos* (Linn.).

Nirmus angustus Giebel, 1874. *Insecta epizoa* : 126. Host : *Buteo lagopus* (Pontoppidan).

Nirmus flavidus Giebel, 1874. *Insecta epizoa* : 301. Host : *Buteo jaktal* = *Buteo r. rufofuscus* (J. R. Forster).

Degeeriella giebeli Hopkins, 1947. *Entomologist,* **80** : 77. Host : *Buteo b. buteo* (Linn.).

Degeeriella borealis Carriker, 1956. *Florida Ent.* **39** : 41, figs. Host : *Buteo jamaicensis borealis* (Gmelin).

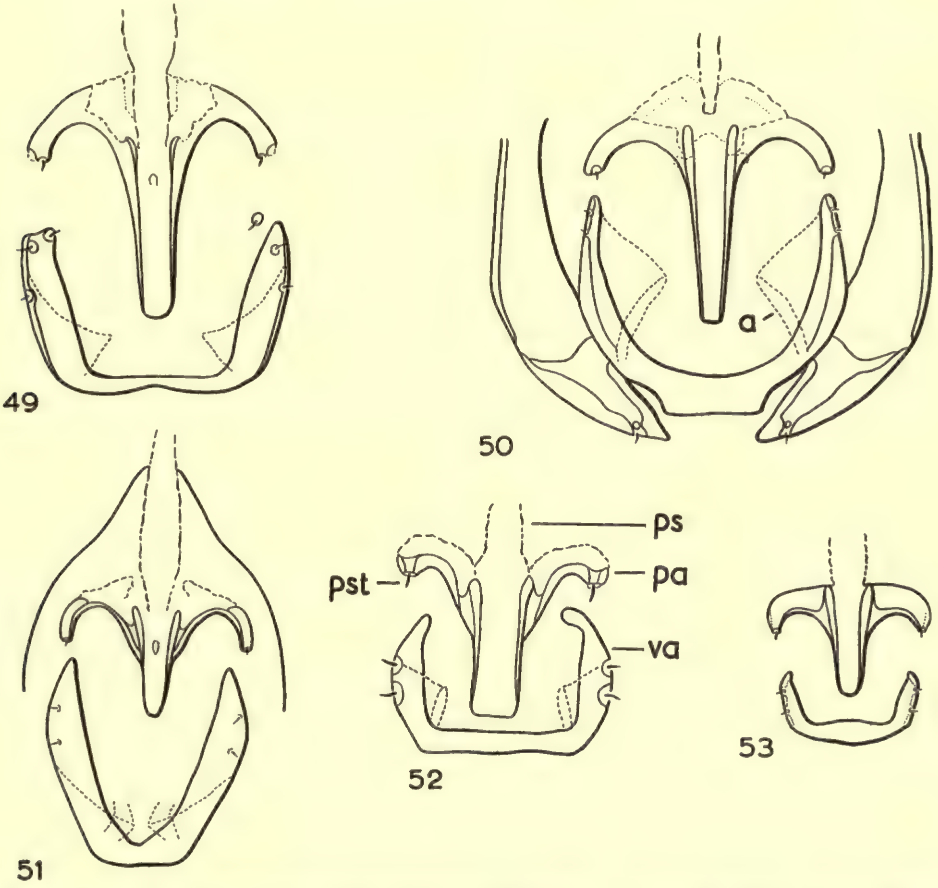
Degeeriella genitalis Carriker, 1956. *Florida Ent.* **39** : 43, figs. Host : *Buteo regalis* (G. R. Gray).

The description, figure and host of *D. fusca* (Nitzsch) make it certain that this name, already preoccupied, is a synonym of *D. fulva* (see also Hopkins, 1947 : 76).

The original description of *D. fulva* together with the fact that it was placed between *fuscus* and *rufus*, both figured, show that Giebel's original specimen must have been the elongated type (Pl. 1, fig. 1) of *Degeeriella* found on *Aquila* not the round-bodied type (Pl. 9, fig. 2). As this species appears to be indistinguishable from that on *Buteo* there seemed a possibility that the known specimens might have been stragglers from this latter genus. However, an examination of all the available material from *Aquila*, that is 18 ♂, 36 ♀ from nine individuals of seven species of *Aquila*, shows there is no doubt that *Aquila* was the true host of at least three of these records; the hosts of the remainder cannot now be confirmed. It can be assumed, therefore, that the species described below is a natural parasite of *Aquila*.

Degeeriella fulva is distinguishable from other species in the species group by a combination of the characters of the marginal carina, ventral suture, tergites II–III, pleural thickening, number of pleural setae and the details of the male genitalia.

Male. Inner dorsal margin of marginal carina indented medially ; ventral suture passes to anterior margin of head (Text-fig. 109, *v.*). Tergite II only with definite median unsclerotized indentation. Pleural thickening narrow with inner edges comparatively straight. Genital plate as in Text-fig. 102. Genitalia as in Pl. 8, fig. 3 and Text-figs. 26, 42 ; there is some variation in the shape of the basal apodeme and of the base of the endomeral plate which does not always show an inner indentation. Internal genitalia as in Text-fig. 1.



Figs. 49–53. Male genitalia, ventral view of distal area. 49. *D. hopkinsi*. 50. *D. leucopleura*. 51. *D. d. discocephalus*. 52. *D. elbeli*. 53. *D. tendeiroi*. *ps.*—penial sclerite ; *pa.*—penial arm ; *pst.*—penial setae ; *va.*—ventral endomeral arm.

Female. Terga of segments IX–XI as in Text-fig. 105 and genital region as in Text-figs. 70, 84.

Chaetotaxy of abdomen. Tergocentral setae : II normally 6[1] range 4–7 ; III–V normally 8, range 6–8 ; VI–VIII normally 6, range 4–8. X in the male has

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[1] In this and all subsequent descriptions the two anterior setae always found on II are omitted.

from 1–3 setae each side; of 16 males from *Aquila* 11 had one (1 + 1) each side, 3 had 1 + 2 and two had 2 + 2; in 80 males taken at random from various species of *Buteo*, 8 had 1 + 1, 19 had 1 + 2, 44 had 2 + 2, 7 had 2 + 3 and 2 had 3 + 3. Tergal setae of segments X–XI of female as in Text-fig. 105. Pleural setae: II–IV 0; V, 1 on each side; VI–VII, 2; VIII, 3. In the male IX has 2 each side and X, 0. In the female IX and X each have 1–3 each side. Sternocentral setae of II–VI normally 4 with the occasional segment of the occasional specimen with 3 or 5. In the male total number of marginal setae of last segment dorsal and ventral, varies from 9–14.

NYMPHS. No nymphs have been seen from any species of *Aquila*; pterothoracic setae and heads of the three instars of specimens taken from *Buteo* are shown in Text-figs. 9, 11–13, 15–17.

VARIATION AND HOST DISTRIBUTION. The detailed comparison made by Tendeiro (1955: 590) between specimens from *Buteo buteo* and *Aquila chrysaëtos* has been studied closely, but the conclusions reached are different; this is probably due to the availability of specimens from a greater number of species of *Aquila* and *Buteo*. Through the kindness of Dr Tendeiro it has been possible to examine three males and six females from *Aquila chrysaëtos*; these have been compared with 15 males and 30 females from six other species of *Aquila* and about 350 males and 400 females from 17 forms of *Buteo*. Certain characters were found to be too variable within the

Measurements in mm.

Male

	A		B			
			Length		Breadth	
	Length	Breadth	Range	Mean	Range	Mean
Head	0·53	0·43	0·50–0·58 (17)	0·55	0·38–0·45 (17)	0·43
Prothorax	—	0·30	—	—	0·25–0·30 (12)	0·27
Pterothorax	—	0·47	—	—	0·42–0·47 (12)	0·45
Abdomen	1·18	0·58	1·02–1·25 (10)	1·14	0·50–0·67 (10)	0·58
Total	2·06	—	1·83–2·20 (11)	2·02	—	—
Genitalia*	0·34	—	0·34–0·38 (4)	0·37	—	—
Head index	0·81	—	0·75–0·79 (17)	0·77	—	—

Female

Head	0·60	0·47	0·58–0·62 (12)	0·59	0·45–0·49 (12)	0·47
Prothorax	—	0·30	—	—	0·28–0·33 (10)	0·29
Pterothorax	—	0·50	—	—	0·47–0·53 (10)	0·50
Abdomen	—	—	1·13–1·43 (9)	1·17	0·60–0·70 (10)	0·65
Total	—	—	2·03–2·35 (9)	2·23	—	—
Head index	0·78	—	0·77–0·81 (11)	0·79	—	—

A. Single specimen from *A. chrysaëtos*. B. Specimens from *Buteo lagopus*.

* Length of genitalia of male taken from anterior margin of basal apodeme to posterior margin of endomeral plate. Number of specimens measured given in brackets. Head index = breadth : length.

C

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (10)	0·50–0·55	0·53	0·40–0·43 (12)	0·42
Prothorax (7)	—	—	0·25–0·28	0·26
Pterothorax (7)	—	—	0·40–0·47	0·43
Abdomen (7)	1·03–1·22	1·13	0·50–0·60	0·54
Total (7)	1·80–2·10	1·96	—	—
Genitalia (4)	0·33–0·37	—	—	—
C.I. (10)	0·77–0·80	0·79	—	—

Female

	Length		Breadth	
	Range	Mean	Range	Mean
Head (9)	0·55–0·58	0·57	0·44–0·46	0·45
Prothorax (9)	—	—	0·27–0·28	0·28
Pterothorax (8)	—	—	0·46–0·49	0·47
Abdomen (7)	1·27–1·38	1·32	0·58–0·62	0·60
Total (7)	2·15–2·30	2·22	—	—
C.I. (9)	0·76–0·80	0·78	—	—

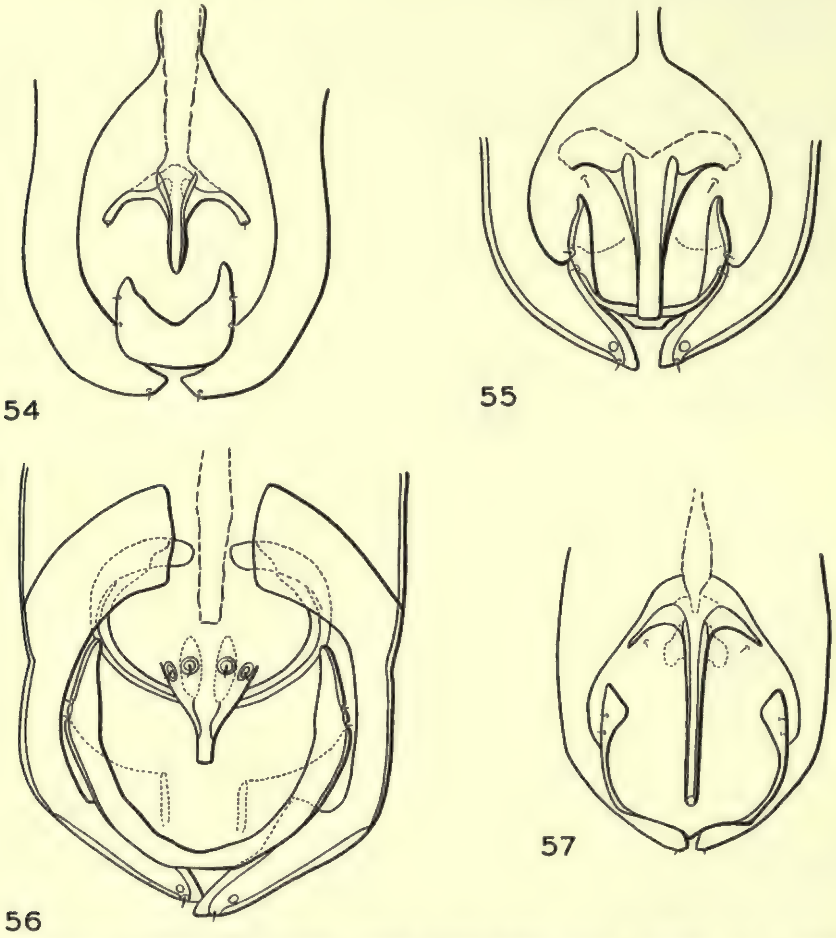
C. Specimens from *Aquila clangula* and *A. wahlbergi*.

D

	Male		*Female*
	Length	Breadth	Breadth
Head	0·50–0·58	0·38–0·47	0·40–0·50
Prothorax	—	0·23–0·30	—
Pterothorax	—	0·38–0·48	—
Abdomen	1·00–1·32	0·48–0·67	—
Total	1·75–2·23	—	—
C.I.	0·75–0·81	—	—

D. Maximum and minimum measurements of specimens from *Buteo* species.

populations from one host species to be used for taxonomic divisions. These are : exact curvature of the anterior margin of the head and thickness of the marginal carinae, both these characters also seem to be affected by the method of treatment (see p. 140) ; outline of gular plate and thoracic sternal plates and the number of associated setae (Text-figs. 112–118) ; shape and extent of unsclerotized area of tergite II ; central narrowing of fused tergite IX–X in male ; outline of male genital plate ; exact outline of basal apodeme, differences in its total length and ratio of its length to that of the mesosome ; shape of penial arms ; ratio of height to breadth of female genital plate and exact outline of subvulval sclerites. Pl. 1, figs. 1–7, show the variation in the shape of the head of specimens from various hosts ; figs. 3–4 are specimens from the same host individual and mounted on the same slide. As already discussed above (p. 134) there is a tendency for the populations on larger host species to have a greater number of larger individuals. This is true of the populations from the species of *Buteo* : measurements of head breadth of 321 males from 17 forms of *Buteo* and 396 females from 16 forms show a difference in the average breadth of the head between some of these populations. Thus, in males (53 specimens) from *Buteo buteo* (the smaller bird) the average is 0·41 mm., while in those (41 specimens) from *Buteo jamaicensis borealis* (the larger bird) the average is 0·44 mm. Populations from other species of *Buteo* have intermediate averages and there is overlap in measurements of individuals of all populations. In addition to size some of the populations are composed of individuals in which the head tends to be more rounded anteriorly, such as that from *Buteo jamaicensis* (Pl. 1, fig. 7), although even in this case there are individuals indistinguishable from those from other



FIGS. 54–57.—Male genitalia, ventral view of distal area. 54. *D. elani*. 55. *D. rufa* from *F. tinnunculus*. 56. *D. r. regalis* from *Milvus milvus*. 57. *D. punctifer*.

hosts. For these reasons it has not been found possible to recognize taxonomically the populations from the different species of *Buteo* and to separate these from the populations from *Aquila*; this is also true of the population parasitic on *Geranoaetus*.

There are considerable difficulties in placing the populations from the following hosts: *Ichthyophaga, Polemaëtus, Lophaëtus, Hieraaëtus*, and *Spilornis*. Specimens from *Ichthyophaga* and *Polemaëtus* can probably be included with *fulva*, but the available material is not in sufficiently good condition for exact comparison. Those from *Lophaëtus* and *Hieraaëtus* are rather similar and have the anterior inner margin of the marginal carina sloping posterolaterally instead of being nearly parallel with the anterior margin as in typical *fulva*; however in some specimens the difference is less marked and a similar condition is found in some specimens from *Aquila wahlbergi*. In the specimens from *Hieraaëtus* the shape of the penial arms differ slightly from those of typical *fulva*, but in *Lophaëtus* both types occur. The population from *Melierax musicus poliopterus* resembles that from *Lophaëtus* in the characters of the margin carina, but specimens from some subspecies of *Melierax metabates* are intermediate between the latter and *fulva*. Specimens from *Spilornis* resemble the *Lophaëtus* population but have a broader head anteriorly and may differ in colour pattern but the material is not in sufficiently good condition for identification. Nymphs are available from the *Melierax metabates* population only; these resemble those from *Buteo*. Taking all these facts into consideration it does not seem that at the present time the classification will be simplified by giving subspecific names to all these poorly separable, perhaps inseparable, populations (see above p. 138) and these are, therefore, here kept for the present under the name *fulva*.

The material available from *Melierax* is confusing: as shown above that from *M. musicus poliopterus* (5 ♂ from 3 individuals from Kenya) and that from some forms of *M. metabates* ((11 ♂ from Portugese E. Africa, Aden (1,000 ♂ and 2,068 ♀ in spirit), Morocco and SW. Africa)) are near *fulva* while 9 ♂ from *M. gabar* and 7 ♂ from *M. metabates* from two individuals from Uganda differ constantly in the characters of the male genitalia and cannot be included in *fulva*. Specimens from *Hypomorphus urubitinga* belong to the *fulva* species group but seem to differ in the details of the male genitalia but the available material is not in sufficiently good condition for a decision on this.

MATERIAL EXAMINED. Three ♂, 6 ♀ from *Aquila chrysaëtos* (Linn.), Portugal; 3 ♀ from *Aquila heliaca* Savigny, Kurdestan; 2 ♀ from *Aquila rapax* (Temminck), Rajputana and Kenya; 3 ♂, 5 ♀ from *Aquila clanga* Pallas, Czechoslovakia and Germany; 4 ♂, 5 ♀ from *Aquila verreauxii* Lesson, Rondebosch, South Africa; 7 ♂, 7 ♀ from *Aquila wahlbergi*, Sundevall, Uganda; 1 ♂, 8 ♀ from *Aquila pomarina* Brehm, no data. Many males and females from the following forms of *Buteo*: *B. rufinus rufinus* (Cretzschmar), *B. rufinus cirtensis* (Levaillant), *B. rufofuscus* (R. J. Forster), *B. r. augur* Rüppell, *B. hemilasius* Temminck & Schlegel, *B. regalis* (G. R. Gray), *B. jamaicensis alascensis* Grinnell, *B. j. borealis* (Gmelin), *B. j. kriderii* Hoopes, *B. j. costaricensis* Ridgway, *B. harlani* (Audubon), *B. l. lineatus* (Gmelin), *B. b. buteo* (Linn.), (including holotype, allotype and paratypes of *D. giebeli* Hopkins), *B. v. vulpinus* (Gloger), *B. b. burmanicus* Hume, *B. l. lagopus* (Pontoppidan), *B. l. s.-johannis* (Gmelin). Four ♂, 25 ♀ from *Geranoaetus melanoleucus australis* Swan, Chile. Eighteen ♂, 25 ♀ from *Icthyophaga ichthyaetus ichthyaetus* (Horsfield), Deccan, India. Eight ♂, 7 ♀ from *Lophaëtus occipitalis* (Daudin), Sudan, Uganda, Kenya. Seven ♂, 7 ♀ from *Hieraaëtus ayresii* (Gurney), Uganda; 1 ♂, 1 ♀ from *H. pennatus* (Gmelin), Palestine. Sixteen ♂, 38 ♀ from *Spilornis cheela albidus* (Temminck), Rajputana; 2 ♂, 1 ♀ from *Spilornis c. cheela* (Latham), Nepal, 2 ♂, 1 ♀ from *Spilornis c. burmanicus* Swan, Thailand. Nine ♂, 7 ♀ from *Polemaëtus bellicosus* (Daudin), Natal and Zoo. Five ♂, 16 ♀ from *Melierax musicus poliopterus* Cabanis, Kenya; 11 ♂, 5 ♀ from *Melierax metabates* subspp. from Aden, Morocco, SW. Africa, Portugese E. Africa.

Degeeriella rima sp. n.

Type host: *Kaupifalco monogrammicus* (Temminck)

(Text-figs. 101, 123)

This subspecies is distinguished from *fulva* by the head being narrower and more rounded anteriorly (Text-fig. 123), by the pleural thickening of at least some of the segments having the ventral outline rounded and in the male by having a definite lateral slit each side of the basal apodeme (Text-fig. 101). This last character should not be confused with a displacement of the lateral thickening of the basal apodeme at the usual slight interruption of this thickening, which may be found in any of the species.

Material examined. Eleven ♂, 8 ♀ from the type host from Uganda and N. Rhodesia.

Holotype male and *allotype* female, slide No. 629 in the British Museum from *Kaupifalco monogrammicus* (Temminck) from Bunyoro, Uganda collected by W. J. Eggeling, 4.iv.1940 and presented by G. H. E. Hopkins. *Paratypes*: 10 ♂, 7 ♀ from the same host species with data as given above.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (10)	0·49–0·53	0·52	0·37–0·40	0·38
Prothorax (2)	—	—	0·23–0·25	—
Pterothorax (2)	—	—	0·38–0·40	—
Abdomen (2)	0·97–1·02	—	0·51–0·52	—
Total (2)	1·73–1·83	—	—	—
Genitalia (1)	0·34	—	—	—
C.I. (10)	0·72–0·77	0·74	—	—

Female

	Length Range	Length Mean	Breadth Range	Breadth Mean
Head (8)	0·53–0·59	0·57	0·40–0·45	0·42
C.I. (8)	0·735–0·775	0·76	—	—

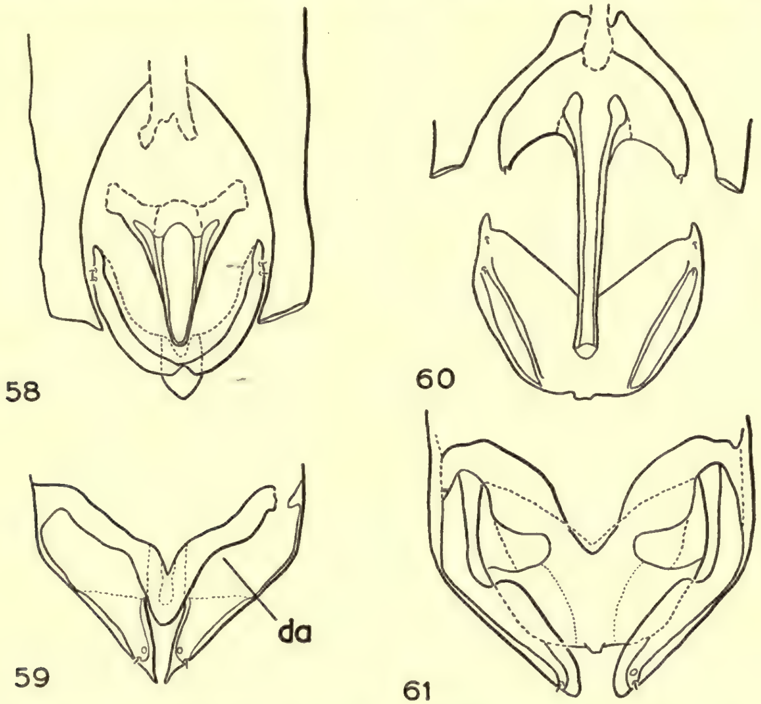
Degeeriella africana sp. n.

Type host : *Stephanoaëtus coronatus* (Linn.)

(Pl. 2, fig. 1 ; text-fig. 85)

This form is distinguished from *fulva* by the shape of the head and marginal carina and the absence of a pleural seta on segment V.

MALE. Head with inner dorsal edge of marginal carina indented medially, ventral suture reaches to anterior margin of head. Tergum II with median indentation, III with small median concavity of varying depth. Width of pleural thickening as in *fulva*, but that of segment VII has a smaller re-entrant head. Genitalia as in *fulva*, except that on the available material the sides of the basal apodeme appear to be straighter.



FIGS. 58–61. Male genitalia. 58–59.—*D. guimarãesi.* 58. Ventral. 59. Dorsal. 60–61.—*D. meinertzhageni.* 60. Ventral. 61. Dorsal. *da.*—dorsal endomeral arm.

FEMALE. Terga of IX–XI as in *fulva*. Genital plate relatively broader in the anteroposterior line and subvulval sclerites shorter and blunter (Text-fig. 85).

CHAETOTAXY OF ABDOMEN. As in *fulva* except that tergocentral setae of III–V are normally 6, range 5–8, and there is no pleural seta each side of V.

MATERIAL EXAMINED. Six ♂, 8 ♀ from *Stephanoaëtus coronatus* (Linn.), Nairobi, Kenya, 5.ii.1917 (skin in Nairobi Museum) collected by G. H. E. Hopkins.

Holotype male and *allotype* female, slide no 624 in the British Museum (Natural History) from *Stephanoaëtus coronatus* with data as given above, presented by Mr. G. H. E. Hopkins. *Paratypes* : 5 ♂, 7 ♀ from the same host individual.

Measurements in mm.

Male

(5)

	Length		Breadth	
	Range	Mean	Range	Mean
Head	0·58–0·60	0·58	0·47–0·48	0·47
Prothorax	—	—	0·28–0·33	0·32
Pterothorax	—	—	0·47–0·50	0·49
Abdomen	1·20–1·33	1·25	0·60–0·67	0·62
Total	2·12–2·31	2·20	—	—
Genitalia (1)	0·43	—	—	—
C.I.	0·79–0·82	0·80	—	—

Female

Head (7)	0·60–0·63	0·62	0·48–0·52	0·50
Prothorax (8)	—	—	0·31–0·35	0·33
Pterothorax (8)	—	—	0·49–0·55	0·52
Abdomen (6)	1·22–1·50	1·37	0·63–0·70	0·67
Total (6)	2·17–2·53	2·33	—	—
C.I. (7)	0·79–0·83	0·81	—	—

Degeeriella beaufacies Ansari, 1955

Type Host : *Butastur teesa* (Franklin)

(Pl. 8, fig. 4 ; Text-figs. 2, 23, 43, 77)

Degeeriella beaufacies Ansari, 1955. *Proc. VIIth Pakistan Sci. Conf.*, Biol. : 43. Host : *Butastur teesa.*

Degeeriella beaufacies Ansari, 1956. *Indian Journ. Entom.* **17** : 395 (1955). Host : *Butastur teesa.*

It is being assumed that the specimens available from *Butastur teesa* are this species, although in the first reference the few words of description do not distinguish the species from any other *Degeeriella*, and the second reference, in which the species is also referred to as new, is even less informative.

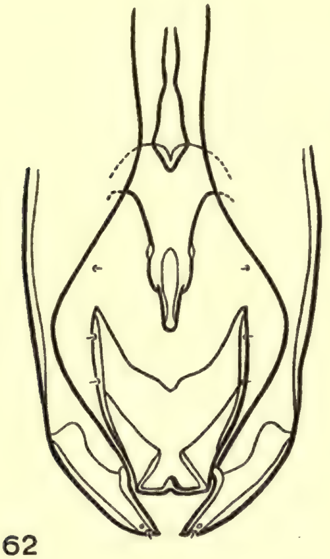
This species is distinguished from *fulva* by the form of the ventral suture, internal and external male genitalia and the nymphs.

MALE. Shape of head similar to that of *fulva*, anterior margin varies from flattened to somewhat rounded ; ventral suture does not reach anterior margin of head ; marginal carinae of temples as in *fulva*. Tergites and pleurites as in *fulva*. Genitalia differ from those of *fulva* in details of the mesosome (Pl. 8, fig. 4, Text-fig. 43). Internal genitalia as in Text-fig. 2.

FEMALE. Terga of segments IX–XI and genital region as in *fulva*, but inner genital sclerites somewhat narrower (Text-fig. 77).

MEASUREMENTS. These fall within the range for specimens of *D. fulva* from *Buteo* species. The measurements given by Ansari for the types of *beaufacies* are markedly smaller.

CHAETOTAXY OF ABDOMEN. As in *fulva* but the total number of marginal setae on the last segment of the male varies from 11–17. One female has 2 tergocentral setae on the anterior margin of IX as in *discocephalus*.



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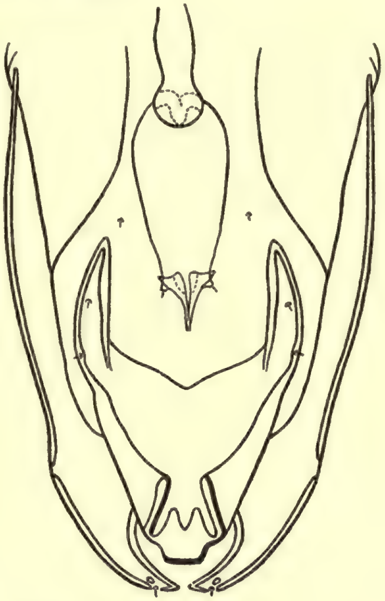

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FIGS. 62–63. Male genitalia, ventral view of distal area.
62. *D. phlyctopygus*. 63. *D. mookerjeei*.

NYMPHS. Third instar nymphs differ from those of *fulva* in having the preantennal region narrowed to a greater extent anteriorly and somewhat pointed (Text-fig. 23).

MATERIAL EXAMINED. Eighty-one ♂, 65 ♀ from *Butastur teesa* from various localities in India; 1 ♂ from *Butastur liventer* (Temminck) from Burma.

Degeeriella carrikeri sp. n.

Type host: *Leucopternis polionota* Kaup.

(Pl. 2, fig. 2, Text-figs. 27, 44, 86)

This species is distinguished from *fulva* by the sculpturing of the dorsal surface of the head, pleural thickening and details of the male genitalia.

MALE. Head similar to that of *fulva*, but flattened anteriorly with slight median concavity; inner margin of marginal carina with median indentation; dorsal sculpturing more marked and forming semicircular patch near anterior margin of head; ventral suture passes nearly to anterior margin and is broad anteriorly; marginal carinae of temples as in *fulva*. Tergites as in *fulva*. Pleural thickening broader than in *fulva*, with ventral outline of segments III–VII and dorsal outline of segments V–VII convex. Genitalia differ from those of *fulva* in the shape of the basal apodeme and details of mesosome.

FEMALE. Terga of IX–XI and genital region as in *fulva* except for the shape of the subvulval sclerites (Text-fig. 86).

CHAETOTAXY OF ABDOMEN. As in *fulva* except for the smaller number of tergocentral setae on segments II–V: II normally 4, range 3–5, III–V normally 6, range 4–7. In the male total number of marginal setae on last segment varies from 13–18.

MATERIAL EXAMINED. Fifteen ♂, 11 ♀ from *Leucopternis polionota* Kaup from S. Paulo, Brazil collected by S. Lima, November, 1949.

Holotype male and *allotype* female in the collection of Dr. L. R. Guimarães from *Leucopternis polionota* with the above data. *Paratypes*: 14 ♂, 10 ♀ from the same host individual.

Named in honour of Mr. M. A. Carriker.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (15)	0·60–0·62	0·61	0·46–0·49	0·47
Prothorax (10)	—	—	0·31–0·35	0·33
Pterothorax (10)	—	—	0·45–0·53	0·48
Abdomen (10)	1·13–1·27	1·19	0·58–0·65	0·60
Total (10)	2·15–2·30	2·19	—	—
Genitalia (3)	0·408–0·412	—	—	—
C.I. (15)	0·770–0·795	0·786	—	—

Female

	Length		Breadth	
	Range	Mean	Range	Mean
Head (10)	0·62–0·67	0·65	0·48–0·52	0·51
C.I. (10)	0·790–0·815	0·796	—	—

Degeeriella emersoni sp. n.

Type host: *Buteogallus gundlachii* (Cabanis)

(Text-figs. 28, 45, 78, 87)

This species is distinguished from *fulva* by the form of the marginal carina, pleural thickening and male genitalia.

MALE. Head with general outline as in *fulva*, but anterior margin of marginal carina flattened and slightly concave medially; inner margin of marginal carina indented medially; ventral suture reaches to or nearly to anterior margin of head; marginal carinae of temples as in *fulva*. Abdominal tergites as in *fulva*. Pleural thickening ventrally as in *fulva,* that is narrow with straight margin ; dorsal outline broader and curved. Genitalia similar to those of *fulva,* but differ in details of penial arms and endomeral plate.

FEMALE. Terga of IX–XI and genital region as in *fulva* ; genital plate and subvulval sclerites as in Text-figs. 78, 87.

CHAETOTAXY OF ABDOMEN. Tergocentral setae with range as in *fulva,* but segments II–V normally have 6–7 rarely 8. Pleural and sternal setae as in *fulva.* In the male the total number of marginal setae of the last segment varies from 11–15.

Measurements fall within the range as given for specimens from *Buteo lagopus* (see table).

MATERIAL EXAMINED. Twenty-three ♂, 34 ♀ from *Buteogallus gundlachii* Cabanis from Doce Legues, Cuba (collected by H. S. Peters). 4 ♂, 3 ♀ in rather poor condition from *Parabuteo unicinctus* (Temminck) seem to belong to this species.

Holotype ♂ and *allotype* ♀ in U.S. Bureau of Entomology, Washington from *Buteogallus gundlachii* with data as above. *Paratypes* : 22 ♂, 33 ♀ from the same host individual.

This species is named in honour of Dr. K. C. Emerson.

Degeeriella nisus (Giebel)

Specimens of *Degeeriella* have been seen from only nine species of *Accipiter* out of the 44 listed by Peters (1931), but even this small number shows more diversity in the populations from the different host species than in the case of the populations from *Buteo.* Four forms are here recognized and placed as subspecies of *nisus,* although when a greater amount of material is available from *Accipiter* it may be necessary to recognize some of the populations as species. For instance, *haydocki* and *frater* are rather different from *nisus* and *vagans* and could perhaps be considered as specifically distinct. It should be noted that there tends to be some variation in the outline of the endomeral plate.

Degeeriella nisus nisus (Giebel), 1866

Type host : *Accipiter n. nisus* (Linn.)

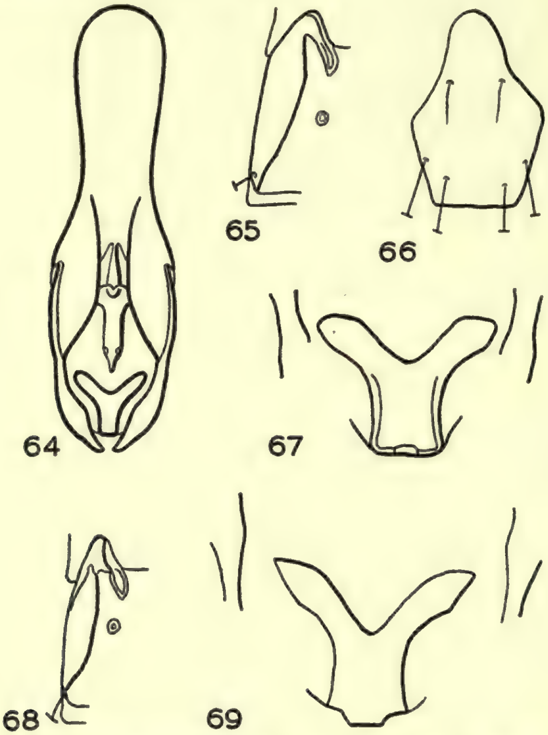
(Pl. 3, fig. 1 ; Pl. 8, fig. 5 ; Text-figs. 24, 29, 46, 88, 110)

Nirmus nisus Giebel, 1866. *Z. ges. NatWiss.* **28** : 364. Host : *Astur nisus* = *Accipiter n. nisus* (Linn.).

This species is distinguished from *fulva* by the shape of the head, the form of the marginal carina, the pleural thickening and the details of the male genitalia and from *fusca* as given under that species.

MALE. Inner edge of marginal carina straight or with slight median indentation ; small area of dorsal thickening immediately below marginal carina ; ventral suture does not reach to anterior margin of head (Text-fig. 110). Marginal temporal carinae broad with many indentations. Terga II–III indented medially. Pleural thickening broad with ventral outline convex. Genitalia similar to those of *fulva* but differ in detail (Pl. 8, fig. 5; Text-figs. 29, 46); there is some variation in the shape of the dorsal endomeral and penial arms. Internal genitalia, represented by one example in rather poor condition, appear to be the same as those of *D. fulva* from *Buteo buteo*.

FEMALE. Abdominal terga of IX–X as in fulva. Genital region similar to that of *fulva*; subvulval sclerites as in Text-fig. 88.



FIGS. 64–69.— 64–67.—*D. phlyctopygus*. 64. Male genitalia. 65. Pleural thickening of segment IV. 66. Male thoracic sternal plate. 67. Dorsal arms of endomeral plate. 68–69.—*D. mookerjeei*. 68. Pleural thickening of segment IV. 69. Dorsal arms of endomeral plate.

CHAETOTAXY OF ABDOMEN. Tergocentral setae: II normally 4, range 3–5; III–VI normally 6, range 4–7, VIII range 4–6; X in the male with 1 seta each side (58 specimens examined), in the female 2 each side; in the male total number of marginal setae, dorsal and ventral on last segment varies from 5–12. Pleural and sternal setae as in *fulva*.

NYMPHS. Anterior margin of head of third instar rather less flattened than in adult (Text-fig. 24).

MATERIAL EXAMINED. Sixty-six ♂, 113 ♀ from various subspecies of *Accipiter nisus* (Linn.) from the British Isles, Hungary, Cyprus, Saudi Arabia, Afghanistan and

Pakistan. Two ♂, 4 ♀ from *Accipiter striatus velox* (Wilson) from British Columbia and U.S.A. are included under *nisus nisus*, although in the small number of specimens available the marginal temporal carinae are somewhat narrower.

Neotype of *Nirmus nisus* Giebel: Male, slide no. 627, in the British Museum (Natural History) from *Accipiter n. nisus* (Linn.) from Kildare, Ireland, presented by Mr. G. H. E. Hopkins.

Degeeriella nisus vagans (Giebel), 1874

Type host: *Accipiter gentilis* (Linn.)

(Pl. 3, fig. 2)

Nirmus vagans Giebel, 1874. *Insecta epizoa*: 126. Host: *Astur palumbarius* = *Accipiter gentilis* (Linn.).

This differs from the nominate form in the larger average size of both sexes, the shape of the head, the inner edge of the marginal carina, which is usually rather more indented medially, the narrower and less indented marginal carinae of the temples and the number of tergocentral setae. Tergocentral setae: II normally 6 (rarely 5 or 8, often 7); III–V normally 8; VI–VIII normally 6; thus in *nisus* the total number of tergocentral setae on segments III–V is 15–20, normally 18 and in *vagans* 22–26, normally 24.

NYMPHS. Third instar nymphs with head similar to those of *nisus nisus*, but differ slightly reflecting the differences in the adult heads.

MATERIAL EXAMINED. Forty-one ♂, 44 ♀ from *Accipiter gentilis* (Linn.) from Germany, Switzerland, Czechoslovakia, Canada and Alaska. Fourteen ♂, 48 ♀ from *Accipiter cooperii* (Bonaparte) from United States of America and British Columbia are not separable from *vagans*.

Neotype of *Nirmus vagans* (Giebel), 1874: Male, slide no. 628 in the British Museum (Natural History) from *Accipiter gentilis* from Rheinfelden, Switzerland, 15.ii.1943 presented by Mr. G. H. E. Hopkins.

Measurements in mm.

Male

D. n. nisus

	Length		Breadth	
	Range	Mean	Range	Mean
Head (50)	0·45–0·52	0·49	0·33–0·39	0·36
Prothorax (10)	—	—	0·22–0·25	0·23
Pterothorax (10)	—	—	0·33–0·38	0·36
Abdomen (10)	0·90–1·10	0·99	0·42–0·53	0·48
Total (10)	1·56–1·87	1·72	—	—
Genitalia (2)	0·29–0·31	—	—	—
C.I. (50)	0·73–0·79	0·76	—	—

Male

D. n. vagans

Head (12)	0·52–0·56	0·54	0·39–0·43 (30)	0·42
Prothorax (10)	—	—	0·27–0·29	0·28
Pterothorax (11)	—	—	0·42–0·47	0·44
Abdomen (10)	1·05–1·17	1·11	0·55–0·59	0·57
Total (10)	1·83–2·00	1·94	—	—
Genitalia (1)	0·32	—	—	—
C.I. (12)	0·77–0·80	0·79	—	—

Female

D. n. nisus

Head (10)	0·52–0·57	0·54	0·37–0·42 (30)	0·40
Prothorax (10)	—	—	0·22–0·27	0·26
Pterothorax (10)	—	—	0·37–0·43	0·41
Abdomen (10)	1·13–1·36	1·27	0·45–0·58	0·54
Total (10)	1·91–2·23	2·09	—	—
C.I. (10)	0·73–0·78	0·75	—	—

Female

D. n. vagans

Head (12)	0·57–0·58	0·57	0·42–0·46 (30)	0·45
Prothorax (10)	—	—	0·28–0·32	0·30
Pterothorax (10)	—	—	0·47–0·49	0·48
Abdomen (10)	1·21–1·35	1·30	0·57–0·63	0·62
Total (10)	2·07–2·25	2·19	—	—
C.I. (12)	0·74–0·81	0·78	—	—

Degeeriella nisus frater (Piaget), 1880

Type host (emended) : *Accipiter badius* (Gmelin)

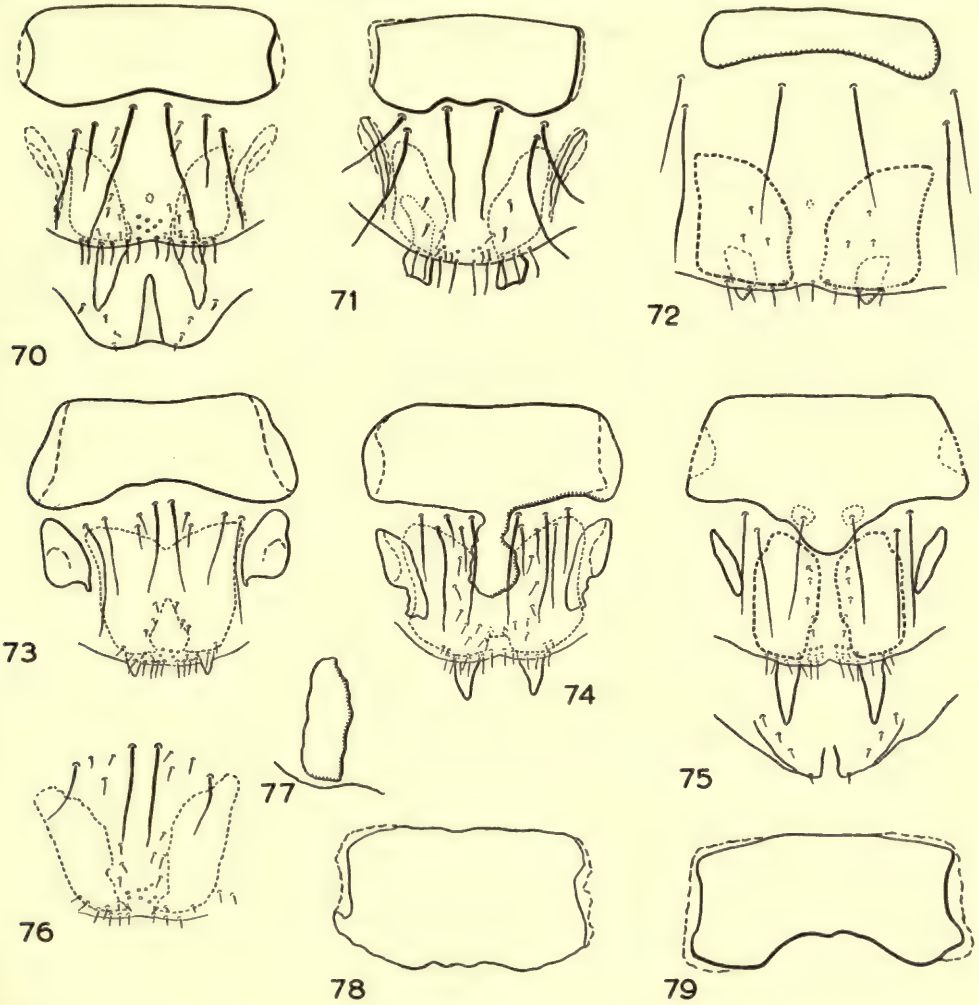
(Pl. 3, fig. 3 : Text-figs. 25, 31–32, 47)

Nirmus frater Piaget, 1880. *Pediculines* : 145, pl. 12, fig. 2. Host : *Lamprotornis amethystina*. Error.

Nirmus frater is represented in the Piaget collection by a single male labelled as from the original host with " Habesh " in brackets, perhaps Habesh in N. Syria. It has not been possible to separate specimens from *Accipiter badius* (African and Syrian birds, see below) from the type of *frater* (although exact comparison of the male genitalia is not possible) and it is presumed that this bird was the original host.

This subspecies is distinguished from the nominate form by the shape of the head, by the slight concavity of the central part of the outer edge of the marginal carina, by the rather larger dorsal central thickening below the marginal carina, by the narrower and more curved penial arms and the shape of the endomeral plate. There is, however, some variation in this last character (Text-figs. 31–32). Tergum II does not have a narrow median indentation as is usual in *nisus*, but a shallow concavity which is sometimes hardly visible ; tergum III and chaetotaxy of the abdomen as in *nisus.*

NYMPHS. Second and third stage nymphs have been seen from *A badius poliopsis* and third stage from *A. virgatus affinis,* these resemble each other and differ from those of *Degeeriella n. nisus* and *D. n. vagans* in having the anterior margin of the head more pointed and a larger thickened area anteriorly.



FIGS. 70–79. 70–76.—Female genital regions. 70. *D. fulva* from *Aquila chyrsaëtos.* 71. *D. hopkinsi.* 72. *D. d. discocephalus.* 73. *D. meinertzhageni.* 74. *D. guimarãesi.* 75. *D. rufa.* 76. *D. elbeli.* 77. Inner genital sclerite of *D. beaufacies.* 78–79.—Female genital plates. 78. *D. emersoni.* 79. *D. leucopleura.*

Specimens have been seen from subspecies of *Accipiter badius* from Syria, Somaliland, Uganda, Kenya, Nepal and Thailand. Those from the Thailand birds (*A.*

badius poliopsis) tend to differ from those from the Syrian and African birds in having the outer edge of the marginal carina somewhat more concave medially and in having none or very few indentations in the inner edge of the marginal carina laterally. The specimens from Nepal resemble those from Thailand in the form of the anterior margin of the head and the African specimens in the lateral indentations of the, marginal carina. However, there are individuals from all these localities which are indistinguishable from each other ; it does not seem reasonable, therefore, to disguish taxonomically the populations from these different subspecies of *Accipiter badius*. There is also some variation in the shape of the dorsal endomeral arms.

MATERIAL EXAMINED. One ♂ type of *Nirmus frater* ; males and females from *Accipiter badius* (Gmelin) from Syria (1 ♂, 3 ♀), from Africa (Uganda, Kenya, Somaliland, 14 ♂, 26 ♀), from Nepal (23 ♂, 27 ♀), from Burma (7 ♂, 10 ♀) and Thailand (9 ♂, 14 ♀). Three ♂, 8 ♀ from *Accipiter tachiro* (Daudin) from Uganda and S. Africa. One ♂, 4 ♀ from *Accipiter virgatus affinis* Hodgson from Thailand and 2 ♂, 3 ♀ from *A. virgatus gularis* (Temminck & Schlegel) from Thailand.

Lectotype of *Nirmus frater* Piaget : ♂ (slide no. 1270) in the Piaget collection, British Museum (Natural History).

Measurements in mm.

Lectotype (♂) *of* frater

	Length	Breadth
Head	0·57	0·43
Prothorax	—	0·29
Pterothorax	—	0·47
Abdomen	1·18	0·58
Total	2·03	—
Genitalia	0·33	—
C.I.	—	—

Breadth of Head of Male Specimens from Accipiter badius

East Africa (11)		Nepal (22)		Thailand (10)	
Range	Mean	Range	Mean	Range	Mean
0·38–0·42	0·40	0·38–0·43	0·42	0·38–0·40	0·39

Degeeriella nisus haydocki subsp. n.

Type host : *Accipiter minullus* (Daudin)

(Pl. 2, fig. 3)

This form is separated from the other known subspecies of *nisus* with the exception of *epustulata* by having only four tergocentral setae on segments II–VIII. It is separated from this latter species by the size and shape of the head. It resembles *frater* in the characters of the anterior margin of the marginal carina ; in having a dorsal triangular-shaped thickening below the marginal carina, which is rather larger ; in the form of tergum II and in the shape of the penial arms.

MATERIAL EXAMINED. Nine ♂, 11 ♀ from *Accipiter minullus* (Daudin) from Gulu, Uganda and N. Rhodesia.

Holotype male and *allotype* female, slide no 625 in the British Museum (Natural History). from *Accipiter minullus*, Mulashi, N. Rhodesia, 27.vi.1955 collected by Major E. L. Haydock. Paratypes : 8 ♂, 10 ♀ from the same host species with data as given above.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (9)	0·49–0·53	0·50	0·35–0·37	0·360
Prothorax (7)	—	—	0·24–0·26	0·250
Pterothorax (7)	—	—	0·37–0·39	0·375
Abdomen (7)	0·95–1·05	0·97	0·46–0·50	0·475
Total (7)	1·71–1·83	1·75	—	—
Genitalia (2)	0·325–0·330	—	—	—
C.I. (9)	0·69–0·73	0·71	—	—

Female

	Length Range	Length Mean	Breadth Range	Breadth Mean
Head (10)	0·53–0·57	0·55	0·37–0·42	0·39
Prothorax (8)	—	—	0·26–0·28	0·27
Pterothorax (8)	—	—	0·40–0·43	0·42
Abdomen (8)	1·17–1·27	1·21	0·52–0·57	0·53
Total (8)	2·00–2·10	2·03	—	—
C.I. (10)	0·68–0·74	0·71	—	—

Degeeriellia nisus epustulata (Carriker), 1903

Type host : *Accipiter bicolor* (Vieillot)

(Text-fig. 124)

Nirmus fuscus epustulatus Carriker, 1903. *Univ. Nebr. Stud.* **3** : 133. Host : *Accipiter bicolor.*

Through the kindness of Mr. Carriker it has been possible to examine a single female paratype of this form. It resembles *haydocki* in having only four tergal setae on each of segments III–VIII, but differs from this form in the shape of the head and the larger size.

Measurements in mm.

Female

	Length	Breadth
Head	0·60	0·47
Prothorax	—	0·30
Pterothorax	—	0·47
Abdomen	1·30	0·57
Total	2·12	—

Degeeriella fusca (Denny), 1842

Type host : *Circus ae. aeruginosus* (Linn.)

(Pl. 4, fig. 3 ; Pl. 8, fig. 6 ; Text-figs. 3, 30, 48)

Nirmus fuscus Denny, 1842. *Mon. Anopl. Brit.* : 49, 118. Host : *Circus rufus* = *Circus ae. aeruginosus* (Linn.).

Nirmus socialis Giebel, 1874. *Insecta epizoa* : 127. Hosts : *Circus cineraceus* = *C. pyargus* (Linn.), and *C. aeruginosus* (Linn.

Nirmus aeruginosi Denny, 1852. *List Brit. Animals in Brit. Mus.*, pt. 11, Anoplura : 16. *Nomen novum* for *Nirmus fuscus* Denny.

Kélerinirmus circi Boetticher & Eichler, 1954. *Biol. Zbl.* **73** : 215. Host : *Circus aeruginosus* (Linn.).

Hopkins (1947 : 76) has discussed the confusion which has arisen over the author of this name and the type host and shown that Denny must be considered as the sole author with *Circus ae. aeruginosus* as the type host.

This species resembles most nearly *D. n. nisus* from which it is distinguished by the colour pattern and details of the male genitalia.

MALE. Dorsal surface of head with an area of lighter sclerotization between the anterior dorsal setae. Inner dorsal margin of marginal carina indented medially ; ventral suture as in *nisus*. Tergites II–III with median indentation ; central area of tergite II more strongly pigmented than lateral areas. Pleural thickening broad and strongly pigmented with dark inner line, contrasting with the rather lightly sclerotized terga ; this character is not so marked in specimens from *Circus cyaneus*. Genitalia similar to those of *fulva* but differ in detail. Internal genitalia as shown in Text-fig. 3.

FEMALE. Terga of IX–XI and genital region as in *fulva*.

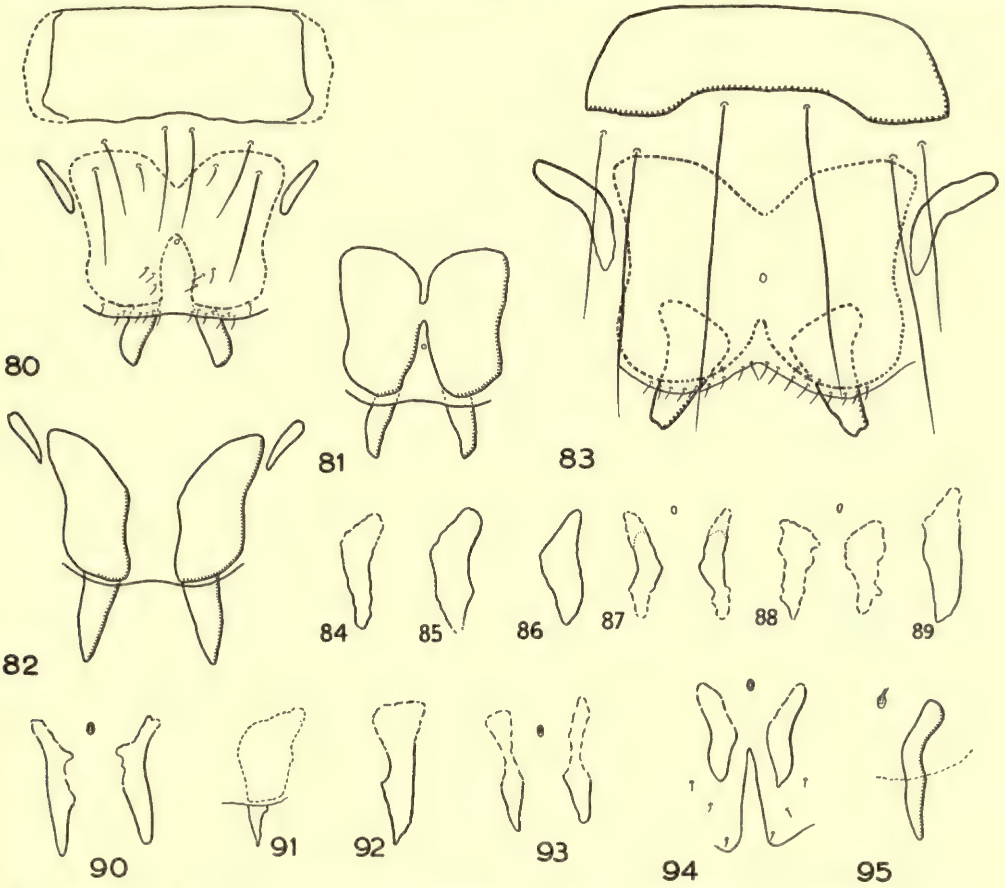
CHAETOTAXY OF ABDOMEN. Tergocentral setae : II normally 6, range 5–7 ; III–IV normally 8, range 6–9 ; V normally 7–8, range 5–8 ; VI–VII normally 6, range 5–8 ; VIII normally 6, range 4–6 ; X in the male has 1 seta each side (58 examined), in the female 2 each side ; total number of marginal setae on last segment varies from 6–12. Pleural and sternal setae as in *fulva*.

NYMPHS. Third instar nymphs have been seen from two host species, *Circus cyaneus* and *C. melanoleucus* ; these have the anterior margin of the head more pointed than in the adult.

HOST DISTRIBUTION. There appear to be no taxonomically recognizable differences between the population from the five species of *Circus* listed below. Eleven specimens from one host individual of *Circus melanoleucus* average somewhat smaller (breadth of head : 0·40 mm.). Specimens from *Circus cyaneus* do not seem to have the colour pattern quite typical of *fusca*, except for the darker central area of tergum II ; it is possible that these may prove to be a distinct subspecies, but fresh material from all hosts is needed.

MATERIAL EXAMINED. Fifty-five ♂, 81 ♀ from *Circus aeruginosus* (Linn.) from Czechoslovakia, Malta, Cyprus, Saudi Arabia, India, Ceylon, Cape Colony ; 13 ♂, 37 ♀ from *Circus c. cyaneus* (Linn.) from Orkneys, Hungary and Czechoslovakia ;

10 ♂, 12 ♀ from *Circus cyaneus hudsonius* (Linn.) from British Columbia and various localities in the United States of America ; 55 ♂, 74 ♀ from *Circus pygargus* (Linn.) from Cyprus and Kenya ; 16 ♂, 24 ♀ from *Circus macrourus* (S. G. Gmelin) from N. Africa, Saudi Arabia and Aden ; 10 ♂, 9 ♀ from *Circus melanoleucus* (Pennant) from Assam and Thailand. In the Denny collection there are 7 ♀ labelled *Nirmus fuscus* by the person responsible for mounting this collection and who rarely kept Denny's original labels. These specimens have no host label, but three of the slides have a small circular (probably original) label with what appears to be " *aeruginos* ". This must refer either to *aeruginosi*, the new name given to *fuscus* by Denny in 1852 or to the name of the host, *C. aeruginosus*. The three females so labelled together



FIGS. 80–95. 80–83.—Female genital regions. 80–81.—*D. r. regalis*, to show variation ; 80 from *Milvus m. milvus* and 81 from *Milvus migrans aegyptius*. 82. *D. r. castanea*. 83. *D. punctifer*. 84–95.—Subvulval sclerites. 84. *D. fulva* from *Aquila chrysaëtos*. 85. *D. africana*. 86. *D. carrikeri*. 87. *D. emersoni*. 88. *D. n. nisus*. 89. *D. leucopleura*. 90. *D. elbeli*. 91. *D. elani*. 92. *D. tendeiroi*. 93. *D. meinertzhageni*. 94. *D. guimarãesi*. 95. *D. rufa* from *Falco tinnunculus*.

with one other are the species usually found on *C. aeruginosus*: two other females are *D. r. regalis* and presumably came from *Milvus ictinus* referred to by Denny (1842: 119) and one other female is *D. fulva* and presumably came from *Buteo lagopus* also referred to by Denny. One of the females labelled "*aeruginos*" will be selected as lectotype of *fusca*.

Lectotype: ♀, slide no. 350, in the Denny collection, British Museum (Natural History); paratypes, 3 ♀ in the same collection.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (50)	0·51–0·57	0·54	0·39–0·45	0·42
Prothorax (10)	—	—	0·25–0·28	0·27
Pterothorax (10)	—	—	0·42–0·45	0·43
Abdomen (10)	1·08–1·23	1·14	0·52–0·60	0·56
Total (10)	1·88–2·12	1·98	—	—
Genitalia (2)	0·32–0·35	—	—	—
C.I. (50)	0·75–0·81	0·78	—	—

Female

(10)

	Length		Breadth	
	Range	Mean	Range	Mean
Head	0·57–0·60	0·58	0·42–0·47	0·45
Prothorax	—	—	0·28–0·31	0·29
Pterothorax	—	—	0·47–0·50	0·48
Abdomen	1·31–1·40	1·36	0·62–0·68	0·64
Total	2·22–2·42	2·28	—	—
C.I.	0·75–0·80	0·78	—	—

Degeeriella hopkinsi sp. n.

Type host: *Terathopius ecaudatus* (Daudin)

(Pl. 4, fig. 2; Text-figs. 33, 49, 71)

This species is distinguished from the rest of the *fulva* species group by the presence of a pleural seta on segment IV.

MALE. Head broad and rounded anteriorly; inner edge of marginal carina indented dorsally in mid-line; ventral suture extends to or nearly to the anterior margin. Terga II–III indented; pleural thickening narrow with re-entrant heads normal only on segment III, gradually becoming more and more reduced on the following segments. Genitalia similar to those of *fulva* but differ in detail (Text-figs. 33, 49). There is some variation in the number and position of the setae associated with the ventral arms of the endomeral plate in the five males examined: two specimens had an extra seta each side anterior to the end of the arms, one had three setae on one arm and on the other one anterior to the arm and one on the arm, one specimen was normal and in one the setae could not be seen.

FEMALE. Terga of IX–XI as in *fulva*. Genital region similar to *fulva* but genital plate narrower from side to side and the subvulval sclerites shorter with blunter ends (Text-fig. 71); there are fewer sensillae anterior to the vulval margin.

CHAETOTAXY OF ABDOMEN. Tergocentral setae: II, 6; III–V, 6–8; VI–VIII, 6; X in the male has 1–2 each side and in the female 2. Pleural and sternal setae as in *fulva* except that there is a pleural seta each side of IV.

MATERIAL EXAMINED. Five ♂, 11 ♀ from *Terathopius ecaudatus* (Daudin) from Lodwar, Kenya, 7.iv.1934 (skin in Nairobi Museum) collected by G. H. E. Hopkins.

Holotype male and *allotype* female slide no. 623 in the British Museum (Natural History) from *Terathopius ecaudatus* with data as given above, presented by Mr. Hopkins. *Paratypes*: 4 ♂, 10 ♀ from the same individual.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (5)	0·53–0·57	0·55	0·43–0·48	0·45
Prothorax (5)	—	—	0·28–0·30	0·28
Pterothorax (5)	—	—	0·43–0·49	0·47
Abdomen (4)	1·12–1·22	1·18	0·58–0·65	0·62
Total (4)	1·92–2·07	2·00	—	—
Genitalia (1)	0·38	—	—	—
C.I. (5)	0·81–0·85	0·82	—	—

Female

	Length		Breadth	
	Range	Mean	Range	Mean
Head (11)	0·53–0·59	0·57	0·45–0·50	0·47
Prothorax (7)	—	—	0·28–0·30	0·28
Pterothorax (7)	—	—	0·47–0·50	0·48
Abdomen (7)	1·18–1·28	1·25	0·60–0·63	0·62
Total (7)	2·07–2·17	2·13	—	—
C.I. (11)	0·82–0·85	0·83	—	—

Degeeriella leucopleura (Nitzsch), 1874

Type host: *Circaëtus cinerascens* J. W. Muller

(Pl. 4, fig. 1; Text-figs. 34, 50, 79, 89)

Nirmus leucopleurus Nitzsch, 1874. *In* Giebel, *Insecta epizoa*: 129. Host: *Falco brachydactylus* = *Circaëtus cinerascens* J. W. Muller.

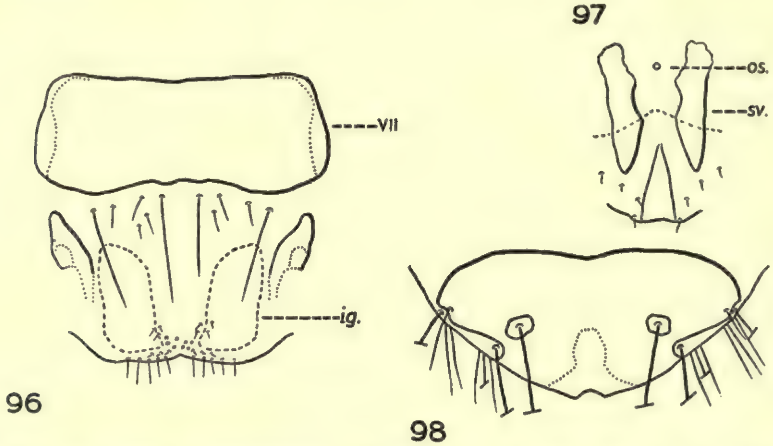
Nirmus temporalis Piaget, 1890. *Tijdschr. Ent.* **33**: 228. Pl. 8, fig. 6. Host: *Buceros manillensis*. Error.

This is a distinctive species separated by the shape of the head, form of the pleural thickening and absence of pleural seta on V.

MALE. Head broad with preantennal region rounded; inner dorsal edge of marginal carina with slight median indentation; ventral suture does not reach anterior margin. Abdomen elongated and with neither terga II nor III with a definite median slit-like indentation although II may show a slight concavity. In spite of the elongated abdomen the pleural thickening does not have the strongly sclerotized re-entrant heads characteristic of this species group. Genitalia as shown in Text-figs. 34, 50.

FEMALE. Terga of IX-XI as in *fulva*. Posterior margin of genital plate deeply emarginate and subvulval sclerites stouter than in *fulva* (Text-figs. 79, 89).

CHAETOTAXY OF ABDOMEN. Tergocentral setae: II normally 6, range 4–6; III–V normally 8, range 6–8; VI–VII normally 6, range 5–7; VII normally 4, range 3–4; X in the male with 1 each side, in female 2 each side. One female has 4 tergocentral setae on II and 6 on III–VII. Pleural setae: II–V, 0; VI–VII, 2 each side; VIII, 3; in the male IX has 3 and X, 0. In the female IX has 3 and X 2 each side. Sternocentral setae: II–VI normally 4, one male has 3 on VI and one female has 6 on V; in the male the last segment does not have the usual spine-like seta each side and the second seta therefore, if present, is not distinguishable from the marginal setae which total from 10–15.



FIGS. 96–98. *Degeeriella phlyctopygus*, female. 96. Genital region. 97. Subvulval sclerites. 98. Dorsal view of segments IX–XI. *ig.*—inner genital sclerites; *os.*—opening of spermathecal tube; *sv.*—subvulval sclerite.

NYMPHS. Second and third instars have the curvature of the anterior margin of the head similar to that of the adult; the preantennal region is shorter and the sides less straight, as is usual in nymphs.

Nirmus temporalis Piaget said to have come from *Buceros manillensis* is represented in the Piaget collection by a single male which appears to be the same as *D. leucopleura* and is presumably a straggler from *Circaëtus*.

MATERIAL EXAMINED. Four ♂, 2 ♀ from *Circaëtus cinerascens* J. W. Müller from Kapenguria, Kenya and 1 ♂ from the same host species from E. Africa (skin); 7 ♂, 11 ♀ from *Circaëtus gallicus* (Gmelin) from France, Czechoslovakia, Egypt (skin) and Cameroons (skin); 1 ♂, 1 ♀ from *Circaëtus cinereus* Vieillot from Portuguese Guinea.

Lectotype of *Nirmus temporalis* Piaget : ♂ in the British Museum (Natural History), slide no. 1421.

Neotype of *Degeeriella leucopleura* (Nitzsch) : ♂ in the Meinertzhagen collection, British Museum (Natural History), slide no. 20568 from *Circaëtus cinerascens* from Kapenguria, Kenya, March 1956.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (5)	0·65–0·67	0·66	0·52–0·53	0·52
Prothorax (5)	—	—	0·32–0·33	0·33
Pterothorax (5)	—	—	0·50–0·55	0·52
Abdomen (3)	1·32–1·43	1·38	0·65–0·68	0·67 (5)
Total (3)	2·33–2·45	2·39	—	—
Genitalia (1)	0·43	—	—	—
C.I. (5)	0·79–0·81	0·80	—	—
	Female			
Head (2)	0·68–0·69	—	0·53	—
Prothorax (2)	—	—	0·35	—
Pterothorax (2)	—	—	0·53–0·55	—
Abdomen (1)	1·40	—	0·67	—
Total (1)	2·43	—	—	—
C.I. (2)	0·77–0·78	—	—	—

The discocephalus *Species Group*

1. Head index greater than 0·94.

2–3. As in *fulva* group.

4. Thoracic sternal plate as in Text-fig. 119.

5. Thorax and abdomen with shape as in Pl. 9, fig. 1.

6–7. As in *fulva* group.

8. Pleural thickening without well sclerotized re-entrant heads.

9. Sternite II in form of central triangular plate, III–VI narrow central strips of sclerotization.

10. Male genital plate small and irregular and less indented laterally than in *fulva* group.

11–13. As in *fulva* group.

14. Setae each side of posterodorsal margin of pterothorax variable in number and position.

15. Pleural setae absent on segments II–III.

16. Sternocentral setae of segments III–VI variable.

17. As in *fulva* group.

This species group is distinguished from the *fulva* group by the shape of head and abdomen ; from the *punctifer* group by the absence of head sutures and chaetotaxy of the temples, and in the females by the dorsal chaetotaxy of tergum IX and in the male by the characters of the male genitalia.

Degeeriella discocephalus discocephalus (Burmeister), 1838

Type host : *Haliaeëtus albicilla* (Linn.)

(Pl. 9, fig. 1 ; Text figs. 35, 51, 72, 106, 119)

Nirmus discocephalus Burmeister, 1838. *Handb. Ent.* **1** : 430. Host : *Aquil. albicilla* = *Haliaeëtus albicilla* (Linn.).

Nirmus discocephalus var. *amblys* Kellogg, 1896. *Proc. Calif. Acad. Sci.* (2), **6** : 499, pl. 67, fig. 6. Host : *Haliaeëetus leucocephalus* (Linn.).

The specimens used by Burmeister for his description of this species were figured by Nitzsch in Giebel, 1874 (pl. 7, fig. 10) and represent the species described below.

MALE. Marginal carina thick and entire ; ventral suture reaches to or nearly to inner margin of marginal carina. Thoracic sternal plate as in Text-fig. 119, but shows some variation in outline ; posterodorsal marginal setae of pterothorax variable in number and position, 4–6 each side (omitting the lateral spine-like seta and the seta with sunken alveolus). Tergum II with median unsclerotized area, tergum III somewhat narrowed medially. Genitalia of *fulva* type ; dorsal endomeral arms may or may not join basal apodeme.

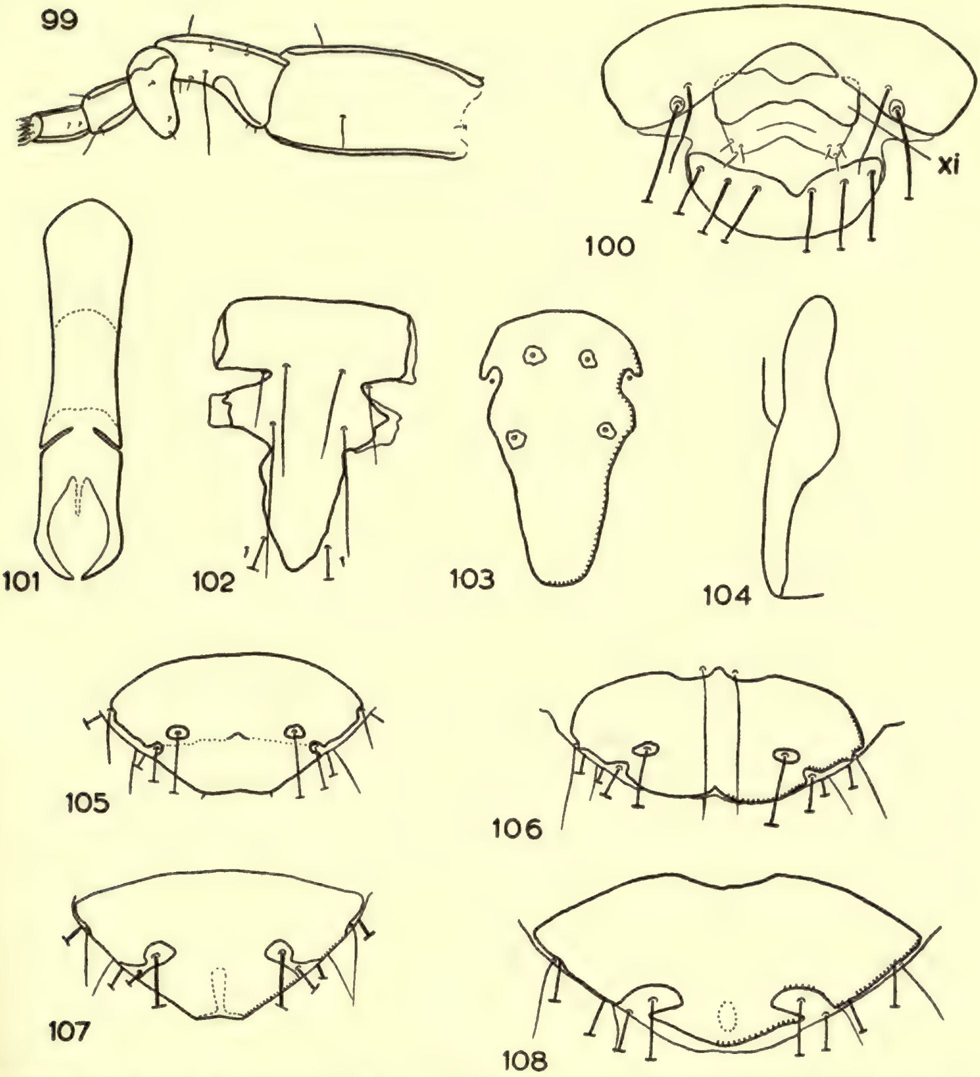
FEMALE. This species differs from all other known *Degeeriella* in having two (occasionally one) setae in the middle of the anterior region of tergite IX ; these setae are occasionally found as an abnormality in species of the *fulva* group. The subvulval sclerites are small and indistinct and almost covered by the vulva (Text-fig. 72).

CHAETOTAXY OF ABDOMEN. Tergocentral setae : II range 6–8 ; III–V, normally 8, range 6–9 ; range 6–8 ; VII–VIII normally 6, range 6–7 ; X in the male normally 2 each side, range 2–4 ; in the female IX has 2 (rarely 1) anterior setae ; X has 2 each side. Pleural setae ; II–III, 0 ; IV–V, 1 each side ; VI–VII, 2 (occasionally 1 or 3 on one side) ; VIII, 3 ; IX, 2 ; X in the male has 0 and in the female 2. Sternocentral setae irregular in number : II, 4–7 ; III–IV, 5–8 ; V, 5–7 ; VI, 4–7 ; total number of setae of segments II–VI of specimens counted varied from 24–34 ; in the male the last pair of sternal setae are both elongated. Total number of marginal setae of last segment in male varies from 12–16.

NYMPH. One third instar from *Haliaeëtus albicilla* has been seen, this resembles the adult in the shape of the head.

MATERIAL EXAMINED. Fourteen ♂, 12 ♀ from *Haliaeëtus albicilla* (Linn.) from Germany, Czechoslovakia, Finland and Russia ; 2 ♂, 5 ♀ from *Haliaeetus pelagicus* (Pallas) from Siberia ; 7 ♂, 3 ♀ from *Haliaeëtus l. leucocephalus* (Linn.) from various localities in N. America. There appear to be no constant characters on which the population (i.e. *D. amblys* (Kellogg)) found on this latter host can be separated from *discocephalus*.

Neotype of *Nirmus discocephalus* Burmeister : ♂ in the British Museum (Natural History), slide no. 617 from *Haliaeëtus albicilla* from Samorin, Czechoslovakia, 9.xii.1952.



Figs. 99–108. 99. Male antenna, *D. mookerjeei*. 100. *D. guimarãesi*, terminal segments of male abdomen. 101. *D. rima*, basal apodeme (lateral slits somewhat exaggerated). 102–103.—Male genital plates. 102. *D. fulva* from *Aquila chrysaëtos*. 103. *D. punctifer*. 104. *D. rufa* from *Falco tinnunculus*, pleural thickening of segment IV, ventral. 105–108.—Segments IX–XI of female abdomens, dorsal. 105. *D. fulva* from *Aquila chrysaëtos*. 106. *D. d. discocephalus*. 107. *D. rufa* from *F. tinnunculus*. 108. *D. punctifer*.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (11)	0·44–0·47	0·46	0·42–0·47	0·45
Prothorax (6)	—	—	0·25–0·28	0·27
Pterothorax (8)	—	—	0·35–0·43	0·40
Abdomen (7)	0·70–0·87	0·77	0·52–0·68 (8)	0·61
Total (7)	1·37–1·53	1·45	—	—
Genitalia (3)	0·42–0·44	—	—	—
C.I. (11)	0·96–1·00	0·98	—	—

Female

	Length		Breadth	
	Range	Mean	Range	Mean
Head (7)	0·50–0·53	0·51	0·50–0·53	0·52
Prothorax (6)	—	—	0·28–0·33	0·31
Pterothorax (6)	—	—	0·45–0·49	0·46
Abdomen (6)	0·97–1·13	1·05	0·68–0·77	0·73
Total (6)	1·17–1·95	1·83	—	—
C.I. (7)	1·00–1·03	1·01	—	—

Degeeriella discocephalus aquilarum Eichler, 1943

Type host : *Aquila n. nipalensis* (Hodgson)

(Pl. 9, fig. 2)

Degeeriella aquilarum Eichler, 1943. *Zool. Anz.* **142** : 92, fig. 1. Host : *Aquila n. nipalensis* (Hodgson).

This subspecies is close to the nominate form, from which it can be separated by the shape of the anterior margin of the head, the slightly better developed pleural thickening, especially on segment III and the fewer number of tergo- and sternocentral setae as follows :

	Tergocentral II–VIII		Sternocentral II–VI	
	Maximum	Minimum	Maximum	Minimum
D. d. discocephalus	52	48	34	24
D. d aquilarum	42	38	22 (1 ♀ with 31)	18

Specimens examined. Nine ♂, 8 ♀ from *Aquila n. nipalensis* Hodgson from Somaliland ; 1 ♂, 1 ♀ from *Aquila nipalensis orientalis* Cabanis, no data ; 4 ♂, 4 ♀ from *Aquila chrysaëtos* (Linn.) from Norway and Serbia ; 1 ♂, 2 ♀ from *Aquila pomarina hastata* (Lesson) from Rajputana, India and Manipur ; 8 ♂, 4 ♀ from *Aquila rapax raptor* A. E. Brehm from Somaliland ; 4 ♂, 3 ♀ from *Aquila h. heliaca* Savigny from Czechoslovakia, Egypt and Rajputana, India ; 1 ♀ from *Aquila clanga* Pallas from Russia.

There appear to be no constant differences between the populations from these species of *Aquila,* although no doubt there will be found some differences in average sizes when larger numbers are available.

Measurements in mm.

Specimens from Aquila n. nipalensis

Male

(9)

	Length		Breadth	
	Range	Mean	Range	Mean
Head	0·44–0·47	0·45	0·43–0·47	0·45
Prothorax	—	—	0·25–0·27	0·26
Pterothorax	—	—	0·38–0·42	0·40
Abdomen	0·81–0·93	0·89	0·55–0·67	0·62
Total	1·45–1·63	1·56	—	—
C.I.	0·96–1·02	0·99	—	—

The elani *Species Group*

1–5. As in *fulva* group.

6. As in *fulva* group : *elbeli* and *tendeiroi.* Tergal plates of segment XI apparent in male : *elani, meinertzhageni, guimarãesi.*

7. As in *fulva* group : *elbeli, tendeiroi* and *guimarãesi.* As in *rufa* group : *elani* and *meinertzhageni.*

8–9. As in *fulva* group.

10. As in *fulva* group : *elbeli.* Male genital plate laterally indented to a greater extent : *elani, tendeiroi, meinertzhageni* and *guimarãesi.*

11. As in *fulva* group : *elbeli, elani, tendeiroi, meinertzhageni.* Female genital plate with median prolongation : *guimarãesi.*

12. As in *fulva* group : *elbeli, elani, tendeiroi.* Inner genital sclerites fused : *meinertzhageni* and *guimarãesi.*

13. As in *fulva* group : *elbeli, elani, tendeiroi.* Distinctive types : *meinertzhageni* and *guimarãesi.*

14. As in *fulva* group.

15. Pleural setae absent on segments II–IV : *elbeli.* Pleural setae absent on segments II–V : *elani, tendeiroi, meinertzhageni, guimarãesi.*

16–17. As in *fulva* group.

It is apparent that these five species do not form a very homogeneous group and are here placed together mainly on the form of the ventral carinae which show a greater development anteriorly than those of any other species groups ; this character is more marked in *meinertzhageni* and *guimarãesi* than in the others. Apart from this character *elbeli* and perhaps *tendeiroi* could be included in the *fulva* group ; the rest of the species share some rather distinctive characters ; *guimarãesi* has certain characters found elsewhere only in *rufa.* It is possible that these five species do not, in fact, form a related group.

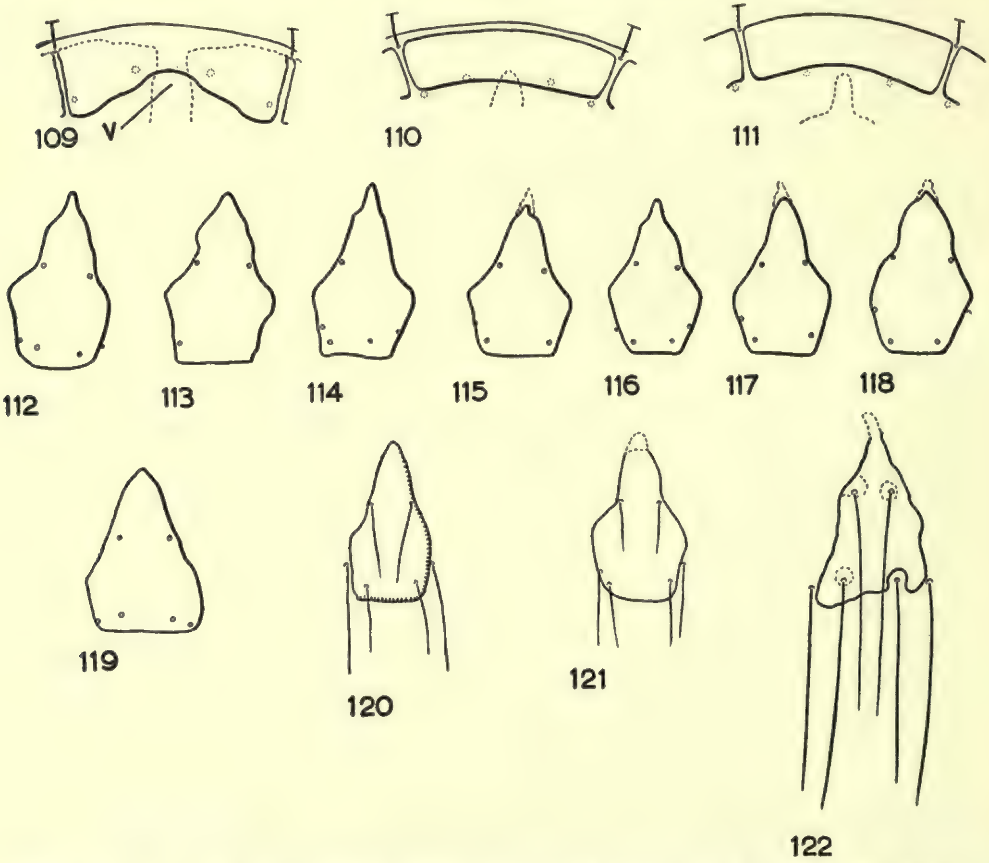
Degeeriella elbeli Clay, 1958

Type Host : *Aviceda leuphotes burmana* (W. L. Sclater)

(Pl. 7, figs. 3, 6 ; Text-figs. 52, 76, 90)

Degeeriella elbeli Clay, 1958. *Proc. R. ent. Soc. Lond.* (B) **27** : 6, Pl. 1, figs. 3, 6 ; Text-figs. 3, 9, 14, 17. Host : *Aviceda leuphates burmana* (W. L. Sclater).

This species is distinguished from the rest of the species group by the presence of pleural setae on segment V, by the shape of the head and the male genitalia. It is separated from members of the *fulva* group, which it resembles in many characters, by the greater development of the ventral carinae anteriorly, and by a combination



FIGS. 109–122. 109–111.—Central anterior margin of head. 109. *D. fulva* from *Buteo lagopus*. 110. *D. n. nisus*. 111. *D. rufa*. 112–122.—Thoracic sternal plates. 112–118.—*D. fulva* (♂♂) to show variation. 112–114. From *Aquila chrysaëtos*. 115–116. From *Aquila wahlbergi*. 117. From *Buteo lagopus*. 118. From *Buteo buteo*. 119. *D. d. discocephalus* (♂). 120. *D. rufa* (♀) from *F. tinnunculus*. 121. *D. r. regalis* (♀) from *Milvus milvus*. 122. *D. punctifer*. *v*.—ventral preantennal suture.

of the characters of the ventral suture, the marginal carinae of the temples, the pleural thickening of the abdomen and the details of the male genitalia.

MALE. Inner dorsal edge of marginal carina indented medially ; ventral suture reaches to or nearly to anterior margin ; marginal temporal carinae broad. Tergites II and III show all stages from a slight median concavity to a well marked slit. Pleural thickening with dorsal outline narrow and straight and ventral outline broader and more rounded. Male genitalia as in Pl. 7, fig. 6 and in Text-fig. 52. Internal genitalia are similar to those of *D. fulva* from *Buteo buteo* but the vesicular apparatus is longer (1 specimen : 0·78 mm.) and the lateral lobes are relatively shorter (0·32 mm.).

FEMALE. Terga of IX–XI as in *fulva* Genital region with rather narrower inner genital and subvulval sclerites than in *fulva* (Text-figs. 76, 90).

CHAETOTAXY OF ABDOMEN. Tergocentral setae : II, 4 ; III–VII normally 6, range 5–8 ; VIII varies from 3–7 ; X in the male with one each side, in female with 2 each side. Pleural and sternocentral setae as in *fulva*. Total number of marginal setae of last segment of male varies from 8–10. One female has only 4 tergocentral setae on each of segments III–V.

NYMPHS. Second and third stage nymphs have the anterior margin of the head pointed.

MATERIAL EXAMINED. Holotype male and allotype female and 16 ♂, 13 ♀ paratypes from *Aviceda leuphotes burmana* from Dansai District, Thailand. A small number of specimens from *Aviceda cuculoides* Swainson from Africa differ from the above, but are not in sufficiently good condition for identification.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (17)	0·55–0·58	0·57	0·43–0·47	0·450
Prothorax (10)	—	—	0·30–0·32	0·315
Pterothorax (10)	—	—	0·48–0·52	0·505
Abdomen (10)	1·20–1·29	1·25	0·58–0·63	0·620
Total (10)	2·12–2·22	2·18	—	—
C.I. (17)	0·78–0·80	0·79	—	—
Genitalia (3)	0·40–0·42	—	—	—
	Female			
Head (10)	0·59–0·62	0·61	0·47–0·50	0·48
C.I. (10)	0·78–0·81	0·80	—	—

Degeeriella tendeiroi sp. n.

Type host : *Gampsonyx swainsonii swainsonii* Vigors

(Pl. 6, fig. 2 ; Text-figs. 37, 53, 92)

This species in general appearance resembles *elani*, but the head is more pointed, the median point being formed by the marginal carina and not in part by the hyaline margin as in *elani*. It is distinguished from other species in the species group, except *elbeli*, by the absence of tergal plates on segments XI of the male and from *elbeli* by the shape of the head.

MALE. Marginal carina pointed medially and inner margin indented; ventral suture does not reach to anterior margin. Tergite II only with median indentation. Pleural thickening broad with inner ventral margin rounded. Genitalia of *fulva* type.

FEMALE. Terga of IX–XI as in *fulva*. Inner genital sclerites as in *elbeli*; subvulval sclerites as in Text-fig. 92.

CHAETOTAXY OF ABDOMEN. Tergocentral setae: II normally 4, range 3–4; III–VI normally 6, range 5–6 (one ♂ with only 3 setae on III); VII–VIII, range 4–6; X in male 2–3 each side, in the female 2 each side. Pleural setae: II–V, 0; remainder as in *fulva*. Sternocentral setae: II, range 2–4, remainder as in *fulva*. Total number of marginal setae of last segment of male varies from 11–12.

MATERIAL EXAMINED. Four ♂, 3 ♀ from *Gampsonyx s. swainsoni* Vigors (skin) from Argentine.

Holotype ♂, *allotype* ♀ in the British Museum (Natural History), slide no. 622 and 3 ♂, 2 ♀ *paratypes* all from *Gampsonyx s. swainsoni* with data as given above.

Named in honour of Dr. João Tendiero in acknowledgment for his co-operation during this study of *Degeeriella*.

Measurements in mm.

Male

	Length Range	Breadth Range
Head (4)	0·48–0·52	0·37–0·38
Prothorax (3)	—	0·25–0·27
Pterothorax (3)	—	0·37–0·43
Abdomen (3)	1·07–1·13	0·48–0·52
Total (3)	1·81–1·93	—
Genitalia (1)	0·28	—
C.I. (4)	0·73–0·77	—

Female

	Length Range	Breadth Range
Head (3)	0·48–0·55	0·38–0·41
C.I. (3)	0·74–0·79	—

Degeeriella elani Tendeiro

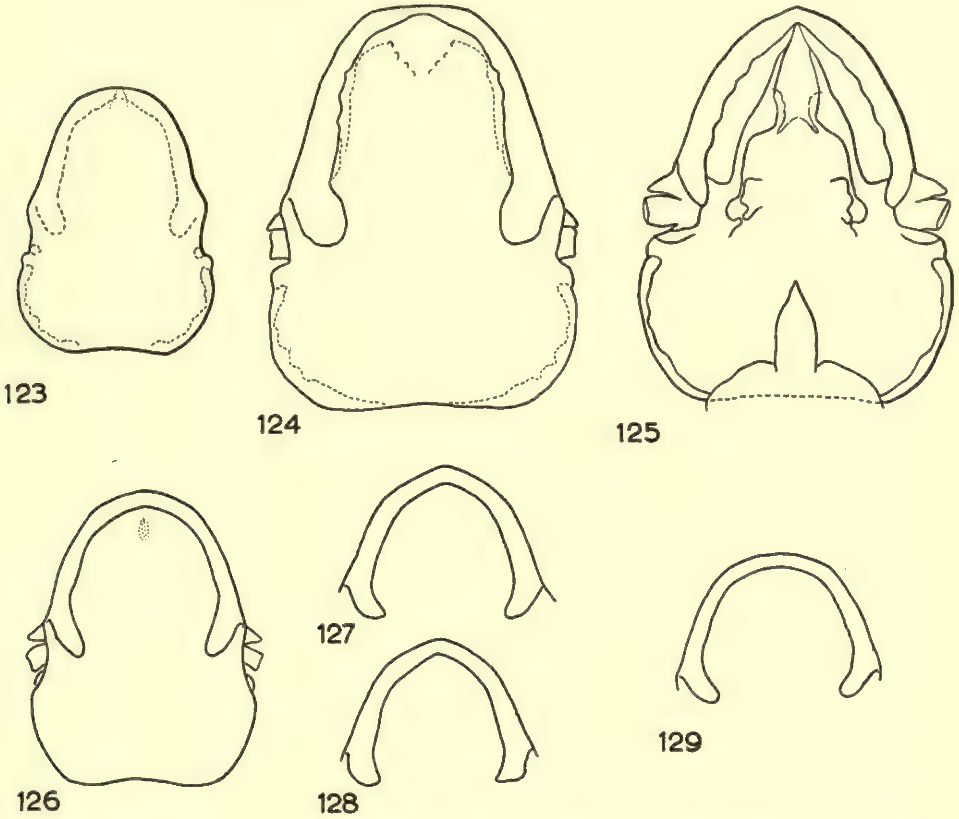
Type host: *Elanus caeruleus* (Desfontaines)

(Pl. 6, fig. 1; Text-figs. 4, 36, 54, 91)

Degeeriella elani Tendeiro, 1955. *Bol. Cult. da Guiné Port.* **9** (35): 598, figs. 36–37, photo. 17–18. Host: *Elanus caeruleus* (Desfontaines).

This species is separated from *elbeli*, *meinertzhageni* and *guimarãesi* by the shape of the head and other characters as given above under the species group; its differences from *tendeiroi* are given above under that species.

MALE. Head pointed anteriorly, the median point is formed largely by the pointed hyaline margin and if this is shrunk or otherwise distorted in a specimen the head will appear less pointed ; inner dorsal margin of marginal carina indented medially ; ventral suture does not reach anterior margin. Tergite II only with median indentation ; tergites of XI present as a small strip of sclerotization each side, immediately below suture between segments X and XI. Pleural thickening similar to that of *tendeiroi*. Genitalia as shown in Text-figs. 36, 54 ; there is considerable variation in the height of the ventral endomeral arms. Internal genitalia from a specimen from *Elanus caeruleus vociferus* from Thailand are rather similar to those of *D. fulva* from *Buteo buteo* (Text-fig. 4).



FIGS. 123–129. Heads of *Degeeriella* ; scales various, see measurements. 123. *D. rima* (♂). 124. *D. n. epustulata*, female paratype. 125. *D. meinertzhageni* (♂). 126–128.—*D. rufa carruthi* (♂♂) drawn to same scale to show variation in shape of anterior margin. 129. Preantennal region of *D. rufa*. from *Falco mexicanus*, male paratype.

FEMALE. Terga IX–XI with unsclerotized areas round setae usually as in Text-fig. 105, but there is some variation in this character. Genital region as in Text-fig. 91.

Chaetotaxy of abdomen. Tergocentral setae: II normally 4, range 4–5; III–V normally 6, range 5–7; VI normally 6, range 4–6; VII normally 4 range 4–6; VIII normally 4, range 4–5; X in the male 1–2 each side, in the female 2 each side. Pleural setae: II–V, 0; rest of pleural setae and sternocentral setae as in *fulva*. Total number of marginal setae, dorsal and ventral of last segment of male varies from 11–14.

Material examined. One ♀ paratype from *Elanus caeruleus* without locality; 11 ♂, 17 ♀ from *Elanus c. caeruleus* (Desfontaines) from Kenya, Uganda, N. Rhodesia and the Cameroons; 5 ♂, 4 ♀ from *Elanus caeruleus vociferus* (Latham) from Deccan, India and Thailand; 3 ♂, 1 ♀ from *Elanus notatus* Gould from Cairns, Australia; 3 ♂, 1 ♀ from *Elanus l. leucurus* (Vieillot) from S. Paulo, Brazil.

Measurements in mm.

Male

(10)

	Length		Breadth	
	Range	Mean	Range	Mean
Head	0·47–0·52	0·49	0·36–0·40	0·37
Prothorax	—	—	0·25–0·27	0·26
Pterothorax	—	—	0·35–0·42	0·39
Abdomen	0·96–1·08	1·03	0·45–0·53	0·48
Total	1·71–1·88	1·78	1·71–1·88	1·79
Genitalia (1)	0·35	—	—	—
C.I.	0·73–0·79	0·75	—	—

Female

(10)

	Length		Breadth	
	Range	Mean	Range	Mean
Head	0·50–0·53	0·52	0·38–0·41	0·39
Prothorax	—	—	0·23–0·28	0·27
Pterothorax	—	—	0·42–0·45	0·43
Abdomen	1·23–1·35	1·28	0·55–0·60	0·57
Total	2·02–2·22	2·10	—	—
C.I.	0·73–0·79	0·76	—	—

Degeeriella meinertzhageni Clay, 1958

Type host: *Chelictinia riocourii* (Vieillot)

(Pl. 7, figs. 2, 5; Text-figs. 60, 61, 73, 93, 125)

Degeeriella meinertzhageni Clay, 1958. *Proc. R. ent. Soc. Lond.* (B) **27**: 4, Pl. I, figs. 2, 5; text-figs. 2, 7, 8, 11, 13, 16. Host: *Chelictinia riocourii* (Vieillot).

This species resembles *guimarãesi* most nearly in the form of the ventral carinae and is distinguished by the shape of the head and the male genitalia.

Male. Inner dorsal margin of marginal carina indented medially; ventral suture does not reach to anterior margin of head; ventral carinae each with flattened edge parallel to that of opposite carina to which is attached a lobe of the pulvinus.

Tergite II only with median indentation ; sclerotization of tergum XI in the form of two small plates variable in size and shape. Genitalia of distinct type as shown in Pl. 7, fig. 5 and Text-figs. 60–61 ; there is some variation in the size of the penial arms and in the position of the setae on the ventral endomeral arms.

FEMALE. Tergites IX–XI with unsclerotized areas as in Text-fig. 107. Genital region as shown in Text-figs. 73, 93 ; inner genital sclerites fused in mid-line.

CHAETOTAXY OF ABDOMEN. Tergocentral setae : II normally 4, range 3–4 ; III–VII normally 6, range 3–8 ; VIII normally 4, range 4–5 ; X in male has 1–2 each side and in the female 2 each side. Pleural setae : II–V, 0 ; VI-VII, one each side, VIII, 3 ; in the male IX has 2 each side and X, 0 ; in the female IX and X each have 1–2 each side. Sternocentral setae : II–VI, 4. In the male total number of marginal setae of last segment varies from 17–24.

NYMPHS. Third instar nymphs have the front of the head pointed as in the adult but the sides of the preantennal region are straighter.

MATERIAL EXAMINED. Holotype male and allotype female and 15 ♂, 9 ♀ paratypes of *D. meinertzhageni* from *Chelictinia riocourii* (Vieillot) from Abyssinia and the Sudan.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (16)	0·50–0·56	0·52	0·38–0·44 (16)	0·40
Prothorax (10)	—	—	0·28–0·31	0·28
Pterothorax (10)	—	—	0·44–0·50	0·47
Abdomen (10)	1·13–1·30	1·22	0·57–0·68	0·63
Total (10)	2·00–2·21	2·08	—	—
Genitalia (3)	0·48–0·50	—	—	—
C.I. (16)	0·73–0·82	0·77	—	—

Female

	Length		Breadth	
	Range	Mean	Range	Mean
Head (10)	0·52–0·57	0·55	0·40–0·45	0·42
Prothorax (5)	—	—	0·28–0·32	0·30
Pterothorax (5)	—	—	0·46–0·52	0·49
Abdomen (5)	1·37–1·44	1·41	—	—
Total (5)	2·33–2·37	2·32	—	—
C.I. (10)	0·73–0·80	0·77	—	—

Degeeriella guimaraesi Clay, 1958

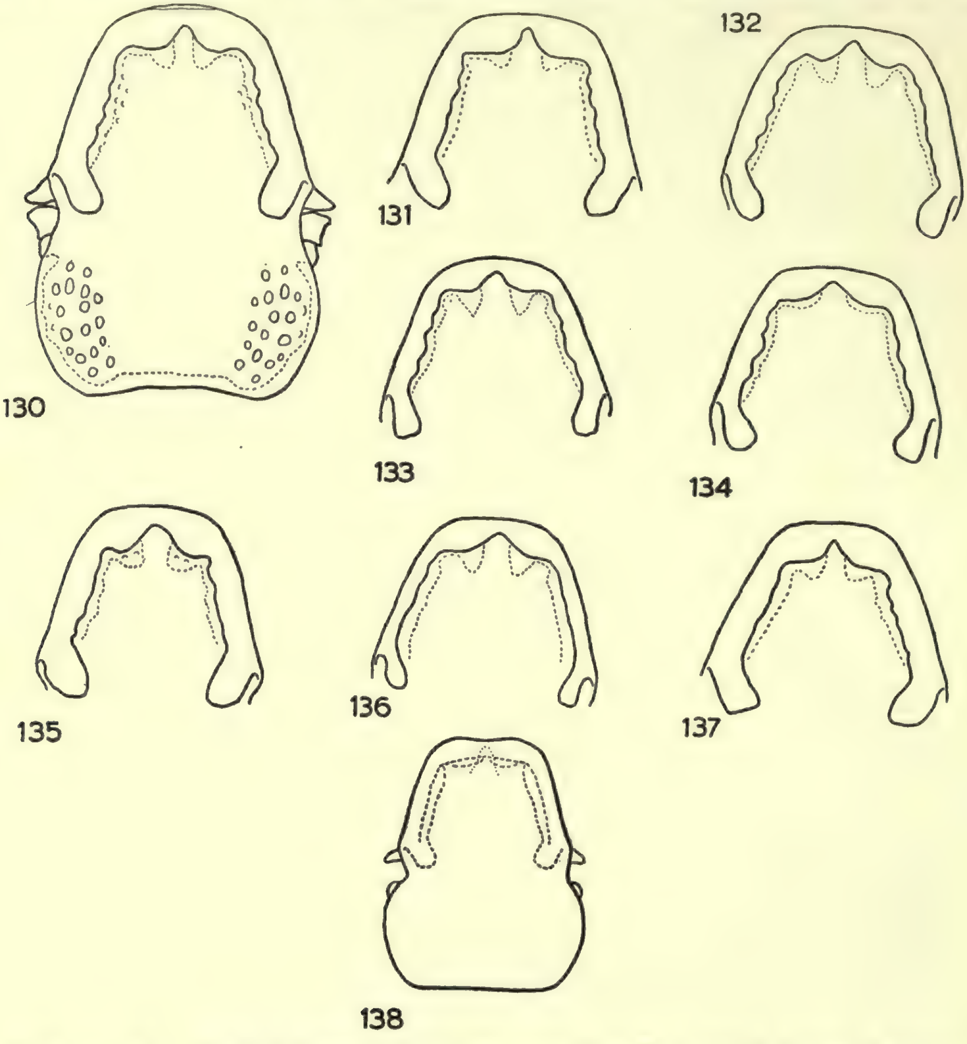
Type host : *Elanoides forficatus forficatus* (Linn.)

(Pl. 7, figs. 1, 4 ; Text-figs. 58, 59, 74, 94, 100)

Degeeriella guimarãesi Clay, 1958. *Proc. R. ent. Soc. Lond.* (B) **27** : 2, pl. I, figs. 1, 4 ; text-figs. 1, 4, 5, 6, 10, 12, 15. Host : *Elanoides f. forficatus* (Linn.).

This is the most distinctive species of the species group, distinguished from all by the characters of the male genitalia and the female genital plate.

MALE. Marginal carina reduced centrally with hyaline margin in this area; inner dorsal margin of marginal carina indented medially; ventral suture does not reach anterior margin; ventral carinae and pulvinus as in *meinertzhageni*; dorsal preantennal region with sculpturing. Tergites II–III without median indentation, but II usually shows a more lightly sclerotized central concave area; shape of fused terga IX–X characteristic (Text-fig. 100); tergal thickening of XI present as a single plate which may be interrupted medially. Pleural thickening narrow.



FIGS. 130–138. Heads of *Degeeriella*, males. 130–137.—*D. r. regalis* (drawn to same scale) from various hosts to show variation in outline of head and marginal carina. 130–132.—From *Milvus milvus*. 133–134.—From *Buteo swainsoni*. 135–137.—From *Buteo galapagoensis*. 138. *D. regalis* subsp. (♂) from *Gypohierax*.

Genitalia distinctive (Pl. 7, fig. 4; Text-figs. 58–59); penial sclerite present but not joined to penis, setae usually associated with penial arms absent; there is some individual variation in the length of these arms and the dorsal endomeral arms may or may not join parameres.

FEMALE. Tergites IX–XI as in *fulva*. Genital region as shown in Text-figs. 74, 94; genital plate with median prolongation; inner genital sclerites fused in mid-line and inner edge of vulva toothed.

CHAETOTAXY OF ABDOMEN. Tergocentral setae of male: 4; III–IV normally 4, range 4–5; V–VI range 4–6; VII–VIII normally 6, range 4–6; X normally 2 + 2, one specimen with 4 + 4. In the female tergocentral setae fewer in number: II–VIII normally 4, range 3–5; X, 2 + 2. Pleural setae: II–V, 0 (two females have one on each side of V); VI–VII, 2 each side; VIII, 3; in the male IX has 2 and X, 0; in the female IX–X, 1–2 each side. Sternocentral setae: II, 2; III–VI normally 4, range 3–4. Total number of marginal setae dorsal and ventral, of the last segment in the male varies from 10–14.

MATERIAL EXAMINED. Holotype male and allotype female and 9 ♀, 15 ♀ paratypes from *Elanoides f. forficatus* (Linn.) from Florida and from *Elanoides f. yetapa* (Vieillot) from Brazil.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (9)	0·57–0·58	0·575	0·43–0·46	0·44
Prothorax (6)	—	—	0·32–0·35	0·33
Pterothorax (6)	—	—	0·47–0·50	0·49
Abdomen (6)	1·12–1·18	1·15	0·55–0·65	0·60
Total (6)	2·00–2·15	2·08	—	—
Genitalia (2)	0·42–0·44	—	—	—
C.I. (9)	0·74–0·79	0·76	—	—

Female

	Length		Breadth	
	Range	Mean	Range	Mean
Head (10)	0·58–0·62	0·60	0·45–0·48	0·47
Prothorax (10)	—	—	0·33–0·37	0·35
Pterothorax (10)	—	—	0·49–0·55	0·52
Abdomen (8)	1·17–1·38	1·30	—	—
Total (8)	2·20–2·33	2·27	—	—
C.I. (10)	0·75–0·79	0·77	—	—

The rufa *Species Group*

1–3. As in *fulva* group.

4. Outline of thoracic sternal plate rather more rounded than in *fulva* group, and as in this group shows individual variation in shape, and arrangement and number of setae.

5. As in *fulva* group.

6. Tergal plates of segment XI apparent in male.

7. Terga of segments IX–XI of female as in Text-fig. 107.
8–10. As in *fulva* group.
11. Female genital plate with median posterior prolongation.
12. As in *fulva* group.
13. As in Pl. 8, fig. 7, penial sclerite absent.
14. As in *fulva* group.
15. Pleural setae absent on II–III and present on X of male.
16. Sternocentral setae of segments III–VI average more than 5 per segment.
17. As in *fulva* group.

This species group contains a single species which has a superficial resemblance to members of the *fulva* group, but is, however, quite distinct from these and other species considered here in having 2 pleural setae each side of segment X in the male and in the absence of the penial sclerite ; in the female it differs from all other species, except *D. guimarãesi*, in the form of the genital plate. The ventral carinae and pulvinus of the nymph resemble those of the nymphs and adults of this latter species.

Degeeriella rufa rufa (Burmeister), 1838

Type host : *Falco tinnunculus* Linn.

(Pl. 6, fig. 3 ; Pl. 8, fig. 7 ; Text-figs. 5, 10, 18–22, 38, 55, 75, 95, 104, 107, 111, 120, 129, 139–164)

Nirmus rufus Burmeister, 1838. *Handb. Ent.* **2** : 430. Host : *Falco tinnunculus* Linn.

Nirmus rufus was described by Burmeister from specimens in the Nitzsch collection from which the figure in Giebel, 1874 (pl. 7, figs. 11–12) were made ; these figures represent the species described below.

The characters distinguishing *D. rufa* are given above under the definition of the species group of which it is the only species.

MALE. Inner edge of marginal carina not or slightly indented medially ; ventral suture variable in form, does not reach anterior margin of head (Text-fig. 111). Tergites II–III with median indentation, that of III occasionally being partly occluded ; tergites of XI present as two well marked sclerites. Pleurites as in Text-fig. 104. Genitalia as in Pl. 8, fig. 7, and Text-figs. 38, 55 ; penial sclerite absent. Internal genitalia characteristic (Text-fig. 5).

FEMALE. Fused terga of IX–XI with a continuous unsclerotized area round the two setae each side (Text-fig. 107). Genital region as in Text-figs. 75, 95 ; genital plate differs from all other known species except *guimarãesi* in having a central posterior prolongation (Text-fig. 95).

CHAETOTAXY OF ABDOMEN. Tergocentral setae : II, normally 6, range 5–8 ; III–VI, normally 8, range 6–11 ; VII normally 6, range 5–8 ; VIII range 4–8, in the female rarely less than 6 ; X, 2 each side. Pleural setae : II–III, 0 ; IV–V, 1 each side ; VI–VII, 2 ; VIII, 3 ; IX–X, 2 each side. Sternocentral setae : II, normally 5, range 4–6 ; III–VI normally 6, range 5–7. Total number of marginal setae of last segment of male varies from 10–14.

NYMPHS. All nymphal instars of this species are available and have been discussed above, p. 129 and figured (Text-figs. 10, 18–22).

Measurements in mm.

D. rufa *from* Falco t. tinnunculus

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (57)	0·46–0·55	0·50	0·37–0·44	0·40
Prothorax (20)*	—	—	0·25–0·29	0·26
Pterothorax (20)	—	—	0·33–0·42	0·37
Abdomen (50)	1·05–1·32	1·15	0·48–0·67 (20)	0·53
Total (20)	1·78–2·03	1·90	—	—
Genitalia (10)	0·41–0·44	0·43	—	—
Head index (56)	0·75–0·83	0·795	—	—
Head index A (28)	0·80–0·86	0·83	—	—

* First 20 picked at random. A. Head index of specimens from *F. rusticolus islandus*.

Female

(20)

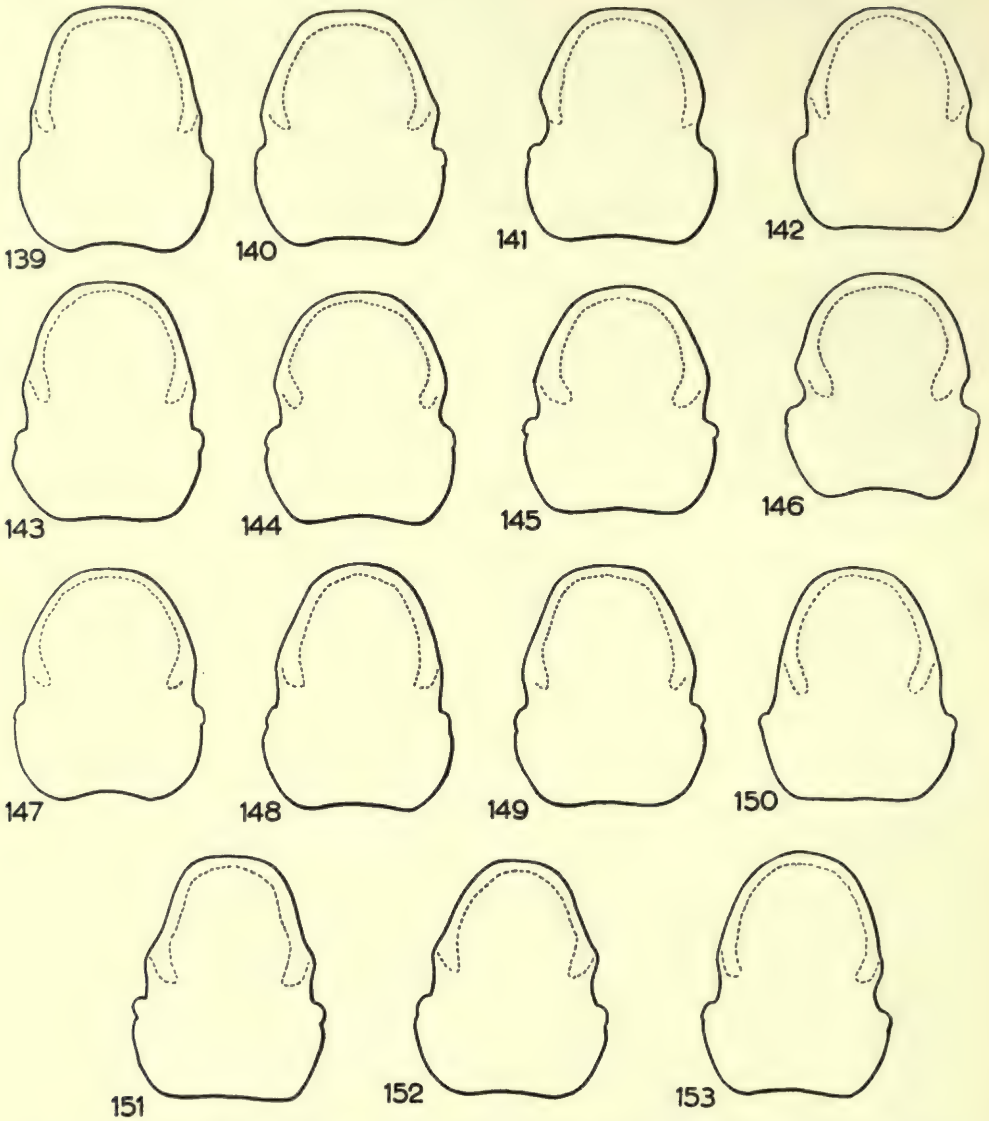
	Length		Breadth	
	Range	Mean	Range	Mean
Head	0·50–0·57	0·53	0·40–0·45	0·43
Prothorax	—	—	0·26–0·29	0·28
Pterothorax	—	—	0·37–0·43	0·41
Abdomen	1·23–1·40	1·31	0·53–0·63	0·59
Total	2·01–2·25	2·14	—	—
Head index	0·78–0·83	0·80	—	—

TABLE I.—*Average Number of Total Tergocentral Setae of Abdominal Segments II-VIII and Breadth of Head at Temples in Males of* D. rufa *from Various Species of* Falco

	Tergocentral setae	Breadth of head in mm.	
		Range	Mean
A	47·6 (30)	0·33–0·40 (51)	0·37
B	—	0·37–0·43 (14)	0·39
C	49·5 (14)	0·38–0·41 (18)	0·40
D	50·6 (51)	0·37–0·44 (57)	0·40
E	52·3 (40)	0·38–0·44 (42)	0·41
F	—	0·40–0·42 (8)	0·41
G	51·9 (11)	0·40–0·43 (9)	0·42
H	51·2 (22)	0·41–0·43 (7)	0·42
I	53·1 (18)	0·40–0·45 (28)	0·43

A, *F. sparverius*; B, *F. subbuteo*; C, *F. columbarius*; D, *F. tinnunculus*; E, *F. jugger*; F, *F. vespertinus*; G, *F. peregrinus*; H, *F. biarmicus*; I, *F. rusticolus*; number of specimens given in brackets.

VARIATION AND HOST DISTRIBUTION. Over 1,160 specimens have been examined from 19 of the 38 species of *Falco*. With the exception of the population from *Falco sparverius* no differences could be found between the populations from the various hosts except in measurements, number of abdominal setae and characters



Figs. 139–153. Heads of *D. rufa* from various species of *Falco*. Scale adjusted so that breadth of temples is approximately the same in all figures, actual breadth of head is given after host name. 139. *Falco biarmicus* subsp. 140. *F. b. biarmicus*, 0·42 mm. 141. *F. c. cherrug*, 0·45 mm. 142. *F. jugger*, 0·42 mm. 143–145.—*F. rusticolus islandus*. 143. 0·42 mm. 144. Paratype of *D. fasciata* (Rudow), 0·43 mm. 145. 0·45 mm. 146–147.—*F. rusticolus candicans*. 146. 0·43 mm. 147. 0·41 mm. 148–149.—*F. peregrinus calidus*. 148. 0·40 mm. 149. 0·41 mm. 150. *F. s. subbuteo*, 0·38 mm. 151–153.—*F. eleonorae*. 151. 0·42 mm. 152. 0·38 mm. 153. 0·39 mm.

of the preantennal region of the head. In the case of the measurements of the head breadth some populations averaged larger but there was overlap between individuals of most of the populations measured (Table I). Again some populations averaged a larger number of tergocentral setae but there were individuals in all populations with a similar number of setae on each segment. A statistical analysis of these numbers may show that the differences between some of these populations are significant, but it is not considered that such populations should be recognized taxonomically on these characters alone. As pointed out by Tendeiro (in press) there is in addition marked differences in the shape of the preantennal region of the head in the populations from some of the species of *Falco* making them easily recognizable, while between others the differences are slight. These differences are also reflected in the nymphs, which in some cases (Text-figs. 21–22) differ more in this stage than in the adults (Text-figs. 144, 147). The problem is further complicated by some populations showing considerable individual variation ; three specimens (Text-figs. 151–153) from *Falco eleonorae* taken from the same host and subjected to the same treatment might be included in three different subspecies ; the specimen from *F. biarmicus* (Text-fig. 139) is more similar to that from *F. peregrinus* (Text-fig. 149) than are the specimens from these two hosts shown in Text-figs. 140, 148. Variation in specimens from other hosts are shown in Text-figs. 143–145, 146–147 and 163–164. Further, it is not possible to reduce these differences to mathematical terms and the human eye is easily subject to optical illusions.

There is a tendency in some cases for the populations in which the members average larger for these to have the preantennal region of the head more rounded (cf. Text-figs. 146 and 150, 142 and 155) and to average a greater number of abdominal setae ; the increase in size of the specimens is roughly related to the size of the host. Thus, similar-sized species of *Falco* may be parasitized by *Degeeriella* with similar average size, a similar number of abdominal setae and heads of a rather similar shape even though these falcons may not be closely related. If the subgeneric divisions of *Falco* as given in Peters (1931) are taken as a measure of relationship, then the not closely related *F. peregrinus* and *F. biarmicus* of similar size are found to have parasites with similar average measurements for the breadth of the head, average number of abdominal setae and a rather similar shaped head (Text-figs. 139, 149) whereas those from the related *tinnunculus* and *sparverius* differ on the larger host by having a larger average measurement of the head with a less narrowed anterior margin and a larger number of abdominal setae. Thus, two or three differences between two populations may all be associated with difference in size which is itself correlated with differences in host size and does not, therefore, necessarily reflect relationship. This is shown in Table I which gives the head measurements and tergocentral setae ; these are arranged in order of increasing size of the breadth of the head. It will be seen that this reflects the size of the hosts, but an exact numerical comparison is not possible as the races of different species of hawks overlap, thus the larger races of the " smaller " *Falco* may overlap with the smaller races of the " larger " species, and moreover the males of the smaller races of the " larger " species may be smaller than the females of the " smaller " species. More material is required from some species to confirm that the differences between the *Degeeriella* populations are significant and adequate samples of parasites from the different races of a species such as *F. peregrinus*, which vary considerably in size, must be measured to see whether those from the smaller races differ from those from the larger. In addition, there is some similarity between the shape of the heads of specimen from related hosts, e.g. those from *F. rusticolus* and *F. jugger*. Thus, the size and shape of the head may reflect either relationship or size of the host irrespective of relationship. Figs. 139–164 show the outline of the anterior margin of the heads of specimens from various species of *Falco* and the related *Ieracidea* ; these are not drawn to the same scale but in such a way that the breadth of the temples is the same throughout, this enables a more accurate comparison of shape to be made. It will be seen from these figures that while some of the populations are quite distinct, others, especially taking into account individual variation, are doubtfully separable. As already discussed above it must be largely a matter of personal opinion as to which of these populations should be recognized taxonomically and it is possible that the systematics might be simplified by considering them as belonging to a single species with a tendency to develop local populations on the different species of *Falco*. The recognition by name of the more distinct populations must result in the endless proliferation of names for those which vary slightly in size, proportions and curvature of the anterior margin, often depending on the individual specimen available. Names have been given to many of the populations, as listed below, and the present writer does not at the moment intend to increase these by naming other populations which do not exactly correspond to these ; this should perhaps wait until adequate series have been seen from more species of *Falco* and their races.

Names Given to the Different Populations of D. rufa *from* Falco

Nirmus fasciatus Rudow, 1869. *Beitr. Kennt. Malloph.* : 20. Host : *Falco islandicus* = *Falco rusticolus islandus* Brunnich.

Nirmus quadraticollis Rudow, 1870. *Z. ges. NatWiss.* **35** : 469. Host : *Falco vespertinus* Linn.

Nirmus nitzschi Giebel, 1874. *Insecta epizoa* : 125, *nec N. nitzschi* Ponton, 1871. Host : *Falco subbuteo* Linn., *F. aesalon* = *F. columbarius aesalon* Tunstall and *F. peregrinus* Tunstall. See *D. drosti*.

Nirmus burmeisteri (Giebel), 1874. *Insecta epizoa* : 126. Host : *Falco rufipes* = *Falco vespertinus* Linn.

Nirmus platyclypeatus Piaget, 1880. *Pediculines* : 145, pl. 12, fig. 1. Host : *Motacilla alba*. Error = *Falco* sp.

Kélerinirmus rufus boliviensis Eichler, 1954. *Beitr. Fn. Perus*, **4** : 38. Host : *Falco fuscocaerulescens pichinchae* Chapman.

Degeeriella rufa drosti Timmermann, 1955. *Náttúrurufraedingurinn*, **1** : 49. *Nomen novum* for *Nirmus nitzschi* Giebel *nec* Ponton, 1871. Host restriction to *Falco columbarius*.

Degeeriella falconoides Carriker, 1956. *Florida Ent.* **39** : 42, figs. Host : *Falco mexicanus* Schlegel.

[1] *Degeeriella masumae* Ansari, 1955. *Proceedings VIIth Pakistan Sci. Conf.*, Biology : 42. Host : *Falco jugger* Gray.

[1] *Degeeriella splendidus* Ansari 1955. *Proceedings VIIth Pakistan Sci. Conf.*, Biology : 42. Host : *Cerchneis tinnunculus interstinctus* McClell = *Falco tinnunculus interstinctus* Horsfield.

[1] The interpretation of these names is doubtful, see below, p. 199.

Material Examined. ♂ lectotype and 2 ♂, 3 ♀ paratypes of *Nirmus fasciatus* Rudow (see Clay & Hopkins, 1955 : 59) ; ♂ lectotype and 5 ♂, 3 ♀ paratypes of *Nirmus quadraticollis* Rudow (see Clay & Hopkins, 1955 : 59) ; ♂ lectotype (slide no. 1388), Piaget collection in the British Museum (Nat. Hist.) and 1 ♂, 1 ♀ paratypes of *Nirmus platyclypeatus* Piaget ; 1 ♂, 1 ♀ paratypes of *Degeeriella falconoides* Carriker ; 4 ♂, 4 ♀ paratypes of *D. rufa applanata* Tendeiro. Over 1,000 specimens (males and females) from the following species of *Falco* : *F. biarmicus* Temminck from Sinai, Somaliland, Tanganyika, Natal and Cape Colony ; *F. cherrug* J. E. Gray from Czechoslovakia and India ; *F. mexicanus* Schlegel from U.S.A. and Mexico ; *F. jugger* J. E. Gray from Afghanistan and India ; *F. rusticolus* Linn. from Greenland, Iceland, Norway and Canada ; *F. peregrinus* Tunstall from Czechoslovakia, Egypt, Sudan, Ceylon, Mandalay and British Columbia ; *F. subbuteo* Linn. from Finland, Uganda, Tanganyika, and Afghanistan ; *F. cuvierii* A. Smith from French Cameroons; *F. eleonorae* Géné from Morocco, Crete and Cyprus ; *F. concolor* Temminck from Egypt ; *F. hypoleucos* Gould from New South Wales, Australia ; *F. fuscocaerulescens* Vieillot from S. Paulo, Brazil ; *F. columbarius* Linn. from British Isles and Hungary ; *F. ardosiaceus* Vieillot from Portugese Guinea and Uganda ; *F. vespertinus* Linn. from Fair Isle, Estonia and Cyprus ; *F. amurensis* Radde from Kenya ; *F. naumanni* Fleischer from Palestine, Kenya and Afghanistan ; *F. tinnunculus* Linn. from British Isles, France, Switzerland, Poland, Madeira, Asia Minor, Palestine, Jordan, Egypt, Uganda, Tanganyika, Cape Colony, Aden, Northern India, Ladak, Sikkim, Manipur and Burma ; *Falco alopex* (Heuglin) from the Sudan. Eleven ♂, 22 ♀ from *Ieracidea orientalis* (Schlegel), no data.

Degeeriella rufa carruthi Emerson, 1953

Type host : *Falco s. sparverius* Linn.

(Text-figs. 126–128)

Degeeriella carruthi Emerson, 1953. *J. Kansas ent. Soc.* **26** : 132, pl. 1, figs. 2, 5. Host : *Falco s. sparverius* Linn.

This subspecies differs from the nominate form in the narrower preantennal region, the anterior margin sometimes being rather pointed, but this pointed appearance is absent in some specimens (cf. Text-figs. 126–128). In addition, both sexes can be recognized by the sculpturing of the middle of the dorsal surface of the head near the anterior margin, this appears as a small dark mark in fresh specimens ; this is sometimes also apparent to a lesser extent in specimens of *D. r. rufa*. In the male there is only one seta each side of the ventral endomeral arm instead of the usual two. Second and third stage nymphs resemble those of *r. rufa* in the shape of the head. Breadth of the head in the male : range 0·33–0·40 mm., mean 0·37 (51 specimens) and in the female : range 0·37–0·46 mm., mean 0·41 (85 specimens).

Material examined. One ♂, 1 ♀ paratypes of *D. carruthi* Emerson ; 81 ♂, 90 ♀ from subspecies of *F. sparverius* Linn. from Alaska, British Columbia, various localities in the United States of America, Cuba, British West Indies and Brazil.

The regalis *Species Group*

1–11. As in *fulva* group.
12. Female inner genital sclerites may or may not be fused in mid-line.
13. Male genitalia of unique type (Text-fig. 56) ; penial sclerite present.
14. As in *fulva* group.
15. Pleural setae absent on II–III.
16. Sternocentral setae of segments III–VI normally 6–8.
17. As in *fulva* group.

This species group which has a superficial resemblance to the *fulva* group can be distinguished in both sexes by the greater number of sternocentral setae and in the males by the genitalia.

Degeeriella regalis regalis (Giebel), 1886

Type host : *Milvus m. milvus* (Linn.)

(Pl. 5, fig. 1 ; Text-figs. 6, 39, 56, 80, 81, 121, 130–137)

Nirmus regalis Giebel, 1866. *Z. ges. NatWiss.* 28 : 364. Host : *Milvus regalis* = *Milvus m. milvus* (Linn.).

Nirmus vittatus Giebel, 1874. *Insecta epizoa* : 127. Host : *Milvus ater* = *Milvus migrans migrans* (Boddaert).

Nirmus appendiculatus Piaget, 1880. *Pédiculines* : 132, pl. 11, fig. 2. Host : *Milvus ater* = *Milvus migrans migrans* (Boddaert) and *Milvus migrans aegyptius* (Gmelin).

Nirmus incertus Piaget, 1885. *Pédiculines Supplément* : 20, pl. 2, fig. 9. Host : *Totanus glottis*. [Error. Probably *Milvus* sp.]

Nirmus curvilineatus Kellogg & Kuwana, 1902. *Proc. Wash. Acad. Sci.* **4** : 470, pl. 29, fig. 4. Hosts : *Nesopelia galapagoensis* and *Oceanites gracilis*. [Error. Probably *Buteo galapagoensis* (Gould).]

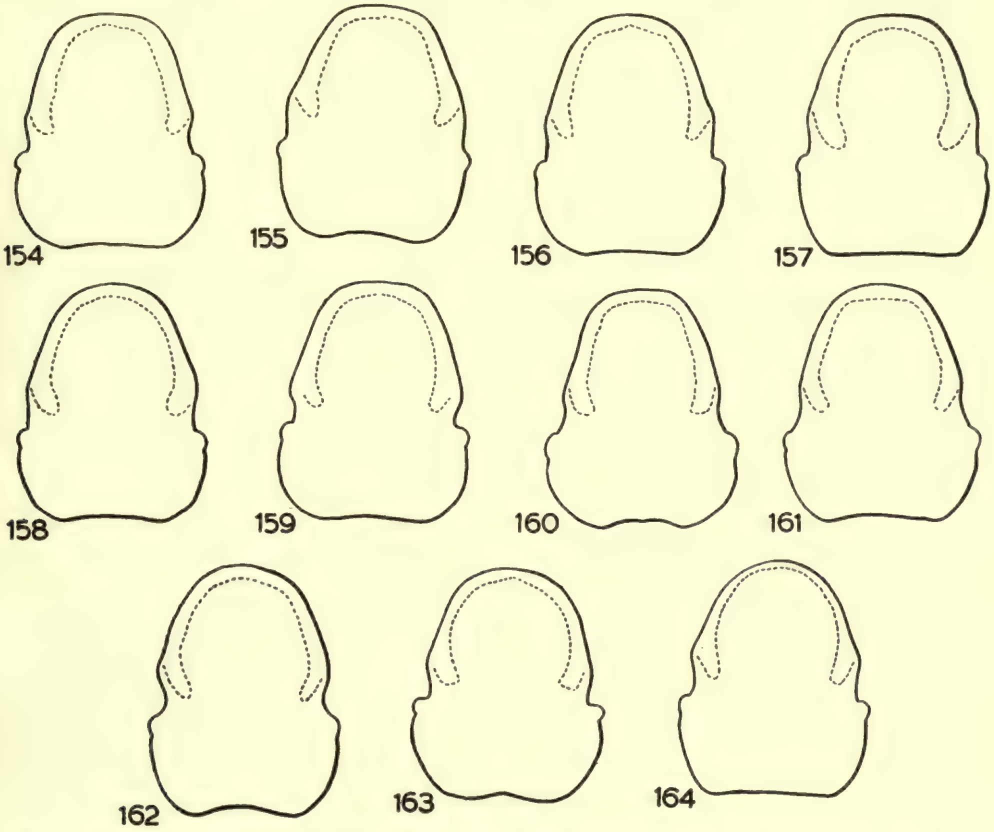
Nirmus pseudophaeus Carriker, 1903. *Univ. Stud. Neb.* **3** : 143, pl. 3, fig. 1. Host : *Pezopetes capitalis*. [Error. Probably *Buteo swainsoni* Bonaparte.]

Nirmus regalis was the name given by Giebel in 1866 to the description of a "*Nirmus* spec. indet." from *Milvus regalis* appearing in Giebel, 1861 (*Z. ges. NatWiss.* **17** : 524).

MALE. Head as shown in Pl. 5, fig. 1 with ventral suture as in *fulva*. Tergite II only with median indentation. Pleural thickening as in *fulva* but broader. The genitalia (Text-fig. 56) differ from all other known species of *Degeeriella* in the form of the penis and in the presence of an anteriorly curved sclerite each side. Most specimens have the usual two setae on each ventral arm of the endomeral plate, but some may have one arm with one seta ; the dorsal arms are usually fused to the side of the basal apodeme, but may be interrupted on one side. There is variation in the length of the penis and the curvature of the lateral margins of the dorsal endomeral plate. The internal genitalia are of characteristic form (Text-fig. 6).

FEMALE. The genital region differs from all preceding species and from the other subspecies of *regalis* in having the two inner genital sclerites either fused together or closely approximated in the mid-line (Text-figs. 80–81).

Chaetotaxy of abdomen. Tergocentral setae: II normally 6, range 5–7; III–VII normally 8, range 7–10; VIII normally 6–7, range 5–8; X in the male normally 2 each side, range 1–3, female 2 each side. Pleural setae: II–III, 0; IV–V, 1 each side: VI–VII, 2; VIII, 3; IX in the male normally 2, occasionally 3 each side; X, 0; IX–X in the female 2, occasionally 3 each side. Sternocentral setae: II normally 6, range 4–7, III–VI normally 8, range 6–9; VII in the male varies from 2 to 4 each side; VIII–XI as in *fulva*. Total number of marginal setae, dorsal and ventral, in the male varies from 11–16.



Figs. 154–164. Heads of *D. rufa* from various species of *Falco* and *Ieracidea* (as figs. 139–153). 154. *Falco cuvierii*, 0·42 mm. 155. *F. concolor*, 0·40 mm. 156. *F. hypoleucos*, 0·39 mm. 157. *F. fuscocaerulescens* subsp. ?, 0·38 mm. 158. *F. columbarius subaesalon*, 0·40 mm. 159. *F. ardosiaceus*, 0·41 mm. 160. *Falco* sp. ? Lectotype of *D. platyclypeata* (Piaget), 0·42 mm. 161. *Falco vespertinus*, 0·38 mm. 162. *F. t. tinnunculus*, 0·39 mm. 163–164.—*Ieracidea orientalis*. 163. 0·42 mm. 164. 0·40 mm.

Nymphs. Second and third instars have been seen from *Milvus migrans parasitus*, except for the normal shorter preantennal region, these resemble the adult in the curvature of the anterior margin of the head.

Specimens from *Buteo galagapoensis* appear to be indistinguishable from those from *Buteo swainsoni*, except that on the available material they average slightly larger in size. It has also not been possible to distinguish these from specimens from *Milvus*, that is *Degeeriella regalis*. The shape of the anterior margin of the head and the thickness of the marginal carina are characters which are found to vary within the populations from the different host species (see Text-figs. 130–137); other characters which vary within the populations are the shape of the gular and thoracic sternal plates, the curvature of the anterior and posterior margins of tergal plate IX–X in the male and the area of junction between the inner genital sclerites; the apparent differences in the length of the penis and shape of the parameres probably depend on the preparation of the specimens. The only character which shows some degree of constancy is the junction of the dorsal endomeral arms with the basal apodeme: in specimens from *Milvus* the arms are usually joined to the basal apodeme each side (34 specimens) and rarely interrupted on one side (5 specimens), whereas in specimens from *Buteo swainsoni* and *B. galapagoensis* the arms are usually separate on both sides (10 specimens) and rarely joined on one side (2 specimens). However, the number of specimens especially from *Buteo*, in which this character can be seen is small and as there is some overlap it does not seem to be desirable to separate the two on this character. Specimens from *Haliaeëtus leucoryphus* show an even distribution between arms joined on one (8 specimens) or neither side (8 specimens) and more rarely specimens (3) with the arms joined on both sides. It is considered, therefore, more satisfactory to include the populations from the two *Buteo* species under *D. r. regalis* and to sink the names *D. curvilineata* and *D. pseudophaea* Carriker as synonyms. The population on *Haliaeëtus vocifer* is however a recognizable subspecies (see below under *D. regalis castanea*).

Specimens from *Haliastur indus* (Boddaert) are found to differ in different localities. Those from Thailand and Ceylon can be separated from *regalis* on a number of characters and are described below as a new subspecies. Specimens from this host collected in Mulug, Deccan (7 ♂, 13 ♀,) Bharatpur, Rajputana (6♂, 4 ♀), Lucknow (1 ♂, 1 ♀) and Dili, Timor (2 ♂, 2 ♀, host not confirmed) cannot be distinguished from *r. regalis*. Collecting records (none from Timor) show that these specimens could not have come from any species of *Milvus*. At present it is not possible to suggest any explanation for this distribution, further species of *Degeeriella* are needed from *Haliastur indus* throughout its range.

Degeeriella regalis has an interesting distribution: it occurs on all the species of *Milvus* (restricted to the Old World), *Buteo galapagoensis* and *Buteo swainsoni* (both restricted to the New World) and possibly *Haliaeetus leucoryphus* (found in eastern Europe and central Asia,) but fresh material is required for certain identification. Specimens have also been found on one individual of *Buteo jamaicensis* in circumstances which preclude contamination after death. Subspecies are found on *Gypohierax angolensis*, *Haliaeëtus vocifer* and on *Haliastur indus* in parts of its range. It seems possible that *regalis* and *fulva* may derive from a common ancestor, that they later became sympatric, both having a wide distribution and that *regalis* has since become extinct on many species, perhaps lingering on rarely on some, as suggested by the specimens found on *Buteo jamaicensis* sympatric with *fulva*: while *fulva* has become extinct on *Milvus*, *Buteo galapagoensis* and *B. swainsoni*.

Degeeriella curvilineata (Kellogg & Kuwana) was described from a male alleged to have come from *Nesopelia galapagoensis* and a female from *Oceanites gracilis* collected by the Hopkins Stanford Galapagos Expedition of 1898–99. The figure of the male shows this to be a typical hawk *Degeeriella*. The only hawk collected by this expedition in the Galapagos (see Snodgrass & Heller, 1904) was *Buteo galapagoensis* (Gould) which must therefore be assumed to be the true host of *D. curvilineata*. Dr. K. C. Emerson has most kindly examined the two syntypes of this species and tells me that these both have more than four setae on the sterna of abdominal segments III–V; this fact together with the original figure show that *curvilineata* must be identical with specimens in the British Museum (Natural History) from *Buteo galapagoensis* and thus becomes a synonym of *r. regalis*.

Degeeriella pseudophaea (Carriker). Through the kindness of Mr. Carriker it has been possible to examine the type of this species. This is a single female which in the characters of the chaetotaxy, form of abdominal terga II–III and in having the subvulval plates fused in the mid-line resembles the species found on *Buteo swainsoni*. The head in size and general shape also resembles that of this species but the marginal carina is markedly different; however, a teneral specimen from this host has a similar form of narrow marginal carina and there seems little doubt that *pseudophaea* is straggler from this host and a synonym of *Degeeriella r. regalis* (Giebel).

Material examined. One ♂, 1 ♀ from *Milvus aegyptiacus* and 3 ♀ from *Milvus ater* types of *Nirmus appendiculatus* Piaget; 1 ♀ type of *Nirmus incertus* Piaget from type host; 1 ♀ holotype of *Nirmus pseudophaeus*; 18 ♂, 15 ♀ from *Milvus m. milvus* (Linn.) from Germany, Czechoslovakia, Jugoslavia and the U.S.S.R.; 70 ♂, 96 ♀ from *Milvus migrans migrans* (Boddaert), *M. m. parasitus* (Daudin), *M. m. arabicus* Swan and *M. m. govinda* Sykes from Italy, Greece, Kenya, Uganda, NW. Rhodesia, Bechuanaland, Saudi Arabia, Aden, Deccan, India and Nepal; 4 ♂, 2 ♀ from *Milvus l. lineatus* (J. E. Gray) from Thailand; 9 ♂, 15 ♀ from *Buteo galapagoensis* (Gould) from the Galapagos Islands; 9 ♂, 15 ♀ from *Buteo swainsoni* Bonaparte from North America; 1 ♂, 12 ♀ from *Buteo jamaicensis borealis* (Gmelin) from Arizona; 14 ♂, 19 ♀ from *Haliastur i. indus* (Boddaert) from Deccan, Rajputana and Lucknow in India; 36 ♂, 28 ♀ from *Haliaeetus leucoryphus* (Pallas) from various localities in India.

Neotype of *Nirmus regalis* Giebel: ♂ (slide no. 626) in the British Museum (Natural History) from *Milvus m. milvus* from Czechoslovakia. Neallotype, ♀ and neoparatypes, 17 ♂, 14 ♀ from the same host from Germany, Czechoslovakia, Jugoslavia and U.S.S.R.

Lectotype of *Nirmus appendiculatus*: ♀ (slide no. 1182) in the Piaget collection of the British Museum (Natural History) from *Milvus aegyptiacus*. Paratypes: 1 ♀ from *Milvus aegyptiacus* and 3 ♀ from *Milvus ater*.

Lectotype of *Nirmus incertus*: ♀ (slide no. 740) in the Piaget collection of the British Museum from *Totanus glottis*.

Degeeriella regalis deignani subsp. n.

Type host : *Haliastur i. indus* (Boddaert)

(Pl. 5, fig. 2 ; Text-fig. 40)

This subspecies differs from the nominate form in the average larger size of the head (the specimens from Ceylon average rather smaller than those from Thailand) and in the slightly different shape of the preantennal region. In the male the shape of the tergite on fused IX–X is intermediate between that of *regalis* and *castanea*, the shape of the endomeral plate differs (Text-fig. 40) and segments II–VI have fewer sternal setae (normally 6 per segment) ; in the female the inner genital sclerites are widely separated. This subspecies is distinguished from *r. castanea* by the shape and colour pattern of the head, and the shape of the endomeral plate and tergite of IX–X in the male. A third instar nymph examined has the anterior margin of the head rather more pointed than those of *r. regalis* or *r. castanea*.

MATERIAL EXAMINED. Five ♂, 7 ♀ from *Haliastur i. indus* from Thailand ; 3 ♂, 3 ♀ from Burma and 6 ♂, 4 ♀ from Ceylon.

Holotype male and allotype female, slide no. 619 in the British Museum (Natural History) from *Haliastur i. indus* (Boddaert), no. RE 2490, from Khlong Khlung district, Thailand, collected by R. Elbel and H. G. Deignan, 28th April, 1953. *Paratypes* : 14 ♂, 13 ♀ from the same host form from Thailand, Burma and Ceylon.

Degeeriella regalis castanea (Piaget), 1890

Type host (emended) : *Haliaeëtus vocifer* (Daudin)

(Pl. 5, fig. 3 ; Text-fig. 82)

Nirmus castaneus Piaget, 1890. *Tijdschr. Ent.* **33** : 232, pl. 8, fig. 9. Host : *Sula piscatrix*.

There is a single male in the Piaget collection with this name and host which agrees with Piaget's figure ; it is the same as specimens from *Haliaeëtus vocifer* and preseumably came from that host.

This subspecies can be distinguished from the nominate form in both sexes by the greater amount of sculpturing on the dorsal surface of the preantennal region of the head (not always apparent in treated specimens) and by the colour pattern of the marginal carina. In the male the fused sclerite of terga IX–X is less arched and narrowed medianly, and in the female the inner genital sclerites are widely separated in the mid-line. The number of sternal setae of segments II–VI average less and both sexes average larger in size. Second and third instar nymphs resemble those of *r. regalis* but have the anterior margin of the head somewhat broader and more rounded.

MATERIAL EXAMINED. One ♂ (slide no. 967) in the Piaget collection ; 15 ♂, 27 ♀ in the collections of the British Museum (Natural History), G. H. E. Hopkins and the Natal Museum from *Haliaeëtus vocifer* (Daudin) from Uganda and Natal.

Lectotype of *Nirmus castaneus* Piaget : ♂ (slide no. 967) in the Piaget collection, British Museum (Natural History).

Degeeriella regalis subsp.

Type host : *Gypohierax angolensis* (Gmelin)

(Text-fig. 138)

Tendeiro (in press).

This subspecies resembles most nearly *D. r. castanea* in the form of terga IX–X and number of sternal setae in the male and the form of the inner genital sclerites of the female ; it is distinguished by the shape of the head (Text-fig. 138). On the available material it is not possible to say whether the absence of pigment is secondary due to the method of treatment nor whether the male genitalia differ in any details from those of the nominate form. In the female the inner genital sclerites are not fused or approximated in the mid-line. Tergocentral setae of male holotype : II, 6 ; III–VII, 8 ; VIII, 6. Sternocentral setae : II, 6 ; III–IV, 7 ; V–VI, 6. The tergal setae of the male are somewhat shorter and stouter than in *r. regalis*.

MATERIAL EXAMINED. Two ♂, 1 ♀ from the type host from Piche, Gabu and Mansoa in Portugese Guinea.

Measurements in mm.

D. r. regalis *from* Milvus milvus.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (10)	0·52–0·58	0·55	0·38–0·43 (18)	0·40
Prothorax (10)	—	—	0·26–0·28	0·28
Pterothorax (10)	—	—	0·43–0·49	0·46
Abdomen (10)	1·05–1·23	1·15	0·52–0·63	0·57
Total (10)	1·87–2·17	2·02	—	—
Genitalia (1)	0·40	—	—	—
C.I. (10)	0·74–0·78	0·76	—	—

Female

	Length		Breadth	
	Range	Mean	Range	Mean
Head (10)	0·57–0·60	0·58	0·41–0·46 (12)	0·44
Prothorax (10)	—	—	0·28–0·30	0·29
Pterothorax (10)	—	—	0·49–0·53	0·51
Abdomen (10)	1·37–1·48	1·41	0·60–0·70	0·65
Total (10)	2·25–2·43	2·33	—	—
C.I. (10)	0·74–0·80	0·77	—	—

Degeeriella r. deignani

Male head

	Thailand (5)		Ceylon (5)	
	Range	Mean	Range	Mean
Length	0·57–0·60	0·58	0·57–0·58	0·57
Breadth	0·42–0·45	0·43	0·41–0·43	0·42

Degeeriella r. castanea

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (15)	0·55–0·60	0·57	0·41–0·45	0·43
Prothorax (10)	—	—	0·27–0·32	0·29
Pterothorax (10)	—	—	0·42–0·50	0·47
Abdomen (10)	1·17–1·32	1·24	0·52–0·67	0·59
Total (10)	2·05–2·25	2·14	—	—
Genitalia (3)	0·41–0·42	—	—	—
C.I. (15)	0·74–0·76	0·75	—	—

Female

	Length		Breadth	
	Range	Mean	Range	Mean
Head (27)	0·57–0·65	0·61	0·43–0·49	0·46
Prothorax (10)	—	—	0·29–0·33	0·32
Pterothorax (10)	—	—	0·51–0·54	0·52
Abdomen (10)	1·50–1·60	1·52	0·62–0·69	0·67
Total (10)	2·47–2·57	2·49	—	—
C.I. (27)	0·74–0·79	0·76	—	—

Degeeriella r. subsp.

(from Tendeiro, in press)

	Male (2)		*Female* (5)	
	Length	Breadth	Length	Breadth
Head	0·57–0·58	0·46–0·47	0·61	0·49–0·50
Prothorax	—	0·34	—	—
Pterothorax	—	0·48–0·49	—	—
Abdomen	1·20–1·23	0·55	—	—
Total	2·16–2·18	—	—	—
C.I.	0·81	—	0·80–0·82	—

The phlyctopygus *Species Group*

1–12. As in *fulva* group.
13. Male genitalia of distinctive type ; penial sclerite present.
14. As in *fulva* group.
15. As in *regalis* group.
16. Sternocentral setae of segments III–VI normally more than 4.
17. As in *fulva* group.

This species group, which has only two known species, is distinguished from all other groups by the form of the male genitalia ; in the characters of the chaetotaxy of the abdomen it resembles the *regalis* group.

Degeeriella phlyctopygus (Nitzsch), 1861

Type Host : *Pernis a. apivorus* (Linn.)

(Pl. 8, fig. 1 ; Text-figs. 62, 64–67, 96–98)

Nirmus phlyctopygus Nitzsch, 1861. *In* Giebel, *Z. ges. NatWiss.* **17** : 526. Host : *Pernis apivorus.*

This species (redescribed by Clay, 1957*a*) is distinguished from *D. mookerjeei* the only other species in the species group, by the antennae and the genitalia in the male and by the shape of the head in the female.

MALE. Anterior margin of head slightly concave, inner margin of dorsal marginal carina slightly indented medially ; ventral suture does not reach anterior margin of head. Tergite II only with definite median indentation. Pleural thickening of segments III–VI with well-developed re-entrant heads (Text-fig. 65). The genitalia (Text-fig. 62) are unlike any other known species of *Degeeriella* except those of *D. mookerjeei.*

FEMALE. Terga of IX–XI and genital region as in Text-figs. 96–98.

CHAETOTAXY OF ABDOMEN. Male. Tergocentral setae : II, 5–6 ; III–V, 8 : VI, 7 ; VII, 6 ; VIII, 6–7 ; X, 1–2 each side. Pleural setae : II–III, 0 ; IV–V, 1 each side ; VI–VII, 2 ; VIII, 3 ; IX, 3–5 ; X–XI, 0. Sternocentral : II, 5–6 ; III, 6–7 ; IV–V, 6 ; VI, 5–6. Total number of marginal setae, dorsal and ventral, of last segment (1 specimen) : 13. In the female tergocentral setae : II normally 6, range 5–7 ; III–V normally 8, range 7–8 ; VI range 6–8 ; VII–VIII normally 6, range 5–6 ; X, 2 each side. Pleural setae : II–VIII as in male ; IX normally 3 each side, range 3–5 ; X normally 3, range 2–3. Sternocentral setae : II normally 6, range 4–6 ; III–IV normally 6, range 6–7 ; V normally 6, range 5–6 ; VI range 4–6 ; VII–XI as in Text-fig. 96.

MATERIAL EXAMINED. ♂ neotype and 2 ♂, 12 ♀ from *Pernis a. apivorus* (Linn.) from Scotland, Germany and Italy.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (2)	0·56–0·58	—	0·42–0·45	—
Prothorax (2)	—	—	0·30–0·31	—
Pterothorax (2)	—	—	0·46–0·47	—
Abdomen (1)	1·17	—	0·62	—
Total (1)	2·10	—	—	—
Genitalia (1)	0·42	—	—	—
C.I. (2)	0·76–0·77	—	—	—

Female

	Length		Breadth	
	Range	Mean	Range	Mean
Head (11)	0·59–0·63	0·61	0·44–0·48	0·46
Prothorax (8)	—	—	0·32–0·34	0·33
Pterothorax (8)	—	—	0·49–0·53	0·51
Abdomen (8)	1·23–1·53	1·42	0·62–0·72	0·68
Total (8)	2·22–2·50	2·42	—	—
C.I. (11)	0·74–0·77	0·75	—	—

Degeeriella mookerjeei Clay, 1957

Type Host : *Pernis ptilorhyncus gurneyi* Stresemann

(Pl. 8, fig. 2 ; Text-figs. 7, 63, 68, 69, 99)

Degeeriella mookerjeei Clay, 1957, *Proc. zool. Soc., Calcutta, Mookerjee Memor. Vol.* : 342, pl. 15, figs. 2, 4, text-figs. 1B, C, 2B, 3D, F, 4B. Host : *Pernis ptilorhyncus gurneyi* Stresemann.

The male of this species is at once distinguished from *phlyctopygus* and all other known species of *Degeeriella* by the enlarged antennae ; the species is further distinguished from *phlyctopygus* in the male by the details of the male genitalia, the greater number of marginal setae on the last abdominal segment and the pleural thickening ; and in the female by the shape of the head and the form of the pleural thickening.

MALE. Marginal carina and ventral suture of head as in *phlyctopygus*, shape as in Pl. 8, fig. 2. Antenna with segment I enlarged and III with distal post-axial angle prolonged (Text-fig. 99). The ocular and marginal temporal setae are shorter and finer than in *phlyctopygus*, a reduction which may be correlated with the increased size of the antennae. Tergite II–III as in *phlyctopygus* ; pleural thickening narrower with smaller re-entrant heads (Text-fig. 68). Genitalia similar to those of *phlyctopygus* but differ in detail (Text-fig. 63) ; it should be noted that the sclerite supporting the penis is curved dorsoventrally and therefore when pressed flat on a slide is distorted in various ways. Internal genitalia unlike any other seen, with short broad vesicular apparatus, apparently formed from two single-chambered lobes only and with vasa deferentia entering near base (Text-fig. 7) ; ductus ejaculatorius long and coiled.

FEMALE. Similar to that of *phlyctopygus* but differs in the shape of the head (see Clay, 1957). There do not appear to be any constant characters distinguishing the genital region of the two species ; there is individual variation in the shape of the genital plate, number of setae and a small amount of variation in the shape of the sclerites.

CHAETOTAXY OF ABDOMEN. Tergocentral setae : II normally 6, range 6–7 ; III-V normally 8, range 6–9 ; VI–VIII in the male normally 6, range 6–7, in the female VI–VII normally 6, range 4–9 ; VIII range 3–6 ; X in the male, 1–3 each side and in the female 2 each side. Pleural setae as in *phlyctopygus*. Sternocentral setae : II, 4–7 ; III–VI in the male normally 6, range 4–6, in the female range 5–8 ; VII–VIII in male as in *fulva*, the usual spine-like seta may be elongated in some specimens. Total number of marginal setae on last segment of male varies from 22–29.

NYMPHS. Third instar nymphs have the anterior margin of the head rather similar to that of *D. fulva* but somewhat more pointed.

MATERIAL EXAMINED. ♂ holotype and 20 ♂, 26 ♀ paratypes from *Pernis ptilorhyncus gurneyi*[1] from Thailand and from *P. ptilorhyncus ruficollis* from Nepal ; 8 ♂, 8 ♀ from *Pernis ptilorhyncus* subsp. from Myitkyina, Upper Burma.

[1] The form *gurneyi* is doubtfully distinct from *ruficollis*.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (9)	0·60–0·63	0·62	0·45–0·47 (10)	0·46
Prothorax (6)	—	—	0·33–0·35	0·34
Pterothorax (6)	—	—	0·49–0·52	0·50
Abdomen (6)	1·17–1·29	1·25	0·55–0·62	0·59
Total (6)	2·21–2·37	2·30	—	—
Genitalia (4)	0·47–0·49	0·48	—	—
C.I. (9)	0·73–0·77	0·75	—	—

Female

	Length		Breadth	
	Range	Mean	Range	Mean
Head (19)	0·62–0·67	0·63	0·47–0·50	0·48
Prothorax (10)	—	—	0·34–0·37	0·35
Pterothorax (10)	—	—	0·50–0·55	0·53
Abdomen (10)	1·55–1·68	1·60	0·64–0·75	0·68
Total (10)	2·57–2·78	2·67	—	—
C.I. (17)	0·745–0·775	0·755	—	—

The punctifer *Species Group*

1. Head index greater than 0·94.
2. Postantennal dorsal sutures present.
3. Three of the marginal temporal setae each side elongated.
4. Thoracic sternal plate as in Text-fig. 122.
5. Thorax and abdomen with general shape as in Pl. 9, fig. 3.
6. As in *fulva* group.
7. As in *rufa* group.
8. Pleural thickening of segments III–VI without well developed re-entrant heads.
9. Sternal thickening reduced and irregular in shape.
10. Male genital plate as in Text-fig. 103.
11. As in *fulva* group.
12. Female inner genital sclerites fused in mid-line.
13. Male genitalia as in Text-figs. 41, 57; penial sclerite present.
14. As in *discocephalus* group.
15. Pleural setae absent on segment II and on X of male.
16. Sternocentral setae of segments III–VI normally more than 4.
17. As in *fulva* group but the last pair of sternal setae are both elongated.

This species group is distinguished from all others by several distinctive characters, see 2, 3, 13 and 15 above; it has a superficial resemblance to *discocephalus* due to the rounded form of the head and abdomen.

Degeeriella punctifer (Gervais), 1844

Type host : *Gypaëtus barbatus barbatus* (Linn.)

(Pl. 9, fig. 3 ; Text-figs. 8, 41, 57, 83, 103, 108, 122)

Philopterus punctifer Gervais, 1844. *In* Walckenaer's *Hist. nat. Ins.* **3** : 353, pl. 49, f. 1. Host : *Gypaëtus barbatus.*

Nirmus euzonius Nitzsch, 1861. *In* Giebel, *Z. ges. NatWiss.* **17** : 521. Host : *Gypaëtus barbatus.*

Some doubt has been raised about the correct interpretation of *Philopterus punctifer* : Eichler (1941*a* : 179 and 1941*b* : 350) followed Giebel (1874 : 209) and Piaget (1880 : 296) in believing this to be a *Falcolipeurus,* and erected a "neotype" (1941*a* : 179), although without description or figure. However, Neumann (1922 : 235) had already shown that Gervais' figure corresponds with the *Degeeriella* from *Gypaëtus barbatus* and not at all with a *Falcolipeurus.* Neumann is undoubtedly correct ; for although the shape of the head in Gervais' figure of the female is quite unlike the species of *Degeeriella,* the figure is also unlike the description of the head, which is referred to as " disciforme ", which in fact it is ; further, the shape of the head of what is obviously meant to be a *Struthioliperus* on the same plate is also totally unlike that of a *Struthiolipeurus,* so that it must be assumed that Gervais was not able to represent shapes accurately. The dorsal view of the female abdomen and the dorsal and ventral view of the male abdomen represents that of the *Degeeriella* described below.

MALE. Head with marginal carina interrupted by ventral suture and only slightly sclerotized at this point dorsally ; narrow but definite hyaline margin present. Mandibles and mandibular supports larger and more strongly sclerotized than in previous species. First marginal temporal seta elongated in addition to the two usual elongated temporal setae. Coni more elongated and more strongly sclerotized than in other species. Postantennal suture present and variable in form ; may be complete and semicircular as in *Lagopoecus* or in the form of two lateral sutures. Thoracic sternal plate as in Text-fig. 122 ; dorsal pterothoracic setae vary from 4–5 each side. Terga II with median unsclerotized area, III narrowed medially. Sternal plates small and irregular, and variable in outline ; genital plate as in Text-fig. 103. Genitalia of distinctive form (Text-figs. 41, 57).

FEMALE. Terga of IX–XI as in Text-fig. 108. Genital region as in Text-fig. 83 ; inner genital sclerites fused in mid-line.

CHAETOTAXY OF ABDOMEN. Tergocentral setae : II normally 6, range, 5–7 ; III–IV normally 8, range 7–9 ; V range 6–8 ; in the male VI–VII, 6–7, occasionally 4 or 5 ; VIII, 4–7 ; IX, 1–3 each side. In the female VI as in male ; VII normally 4, range 3–7 ; VIII normally 4, range 2–6 ; X, 2 each side. Pleural setae : II, 0 ; III–V, 1 each side ; VI–VII, 2 ; VIII, 3 (occasionally 4) ; IX, 2 ; X in the male, 0 and in the female 2 and occasionally 3 on one side. Sternocentral setae : II–V normally 8, range 5–10 ; VI normally 6, range 6–8. In the male the last pair of sternal setae are both elongated. Total number of marginal setae of last segment of male varies from 10–16.

NYMPHS. First and second instar nymphs have been seen, these resemble the adult in the shape of the head, but the marginal carina is fully sclerotized dorsally.

MATERIAL EXAMINED. Eighteen ♂, 34 ♀ from *Gypaëtus barbatus aureus* (Hablizl) from Afghanistan and Sikkim.

Neotype of *Philopterus punctifer* Gervais : Male, slide no. 20071, in the Meinertzhagen collection, British Museum (Natural History) from *Gypaëtus barbatus aureus* from Sikkim ; 16 ♂, 34 ♀ neoparatypes from the same host form.

Neotype of *Nirmus euzonius* Nitzsch : Male, slide no. 10047, in the Meinertzhagen collection, British Museum (Natural History) from *Gypaëtus barbatus aureus* from Afghanistan.

Measurements in mm.

Male

	Length		Breadth	
	Range	Mean	Range	Mean
Head (14)	0·55–0·60	0·57	0·59–0·65	0·63
Prothorax (10)	—	—	0·33–0·37	0·36
Pterothorax (10)	—	—	0·52–0·57	0·54
Abdomen (10)	1·00–1·13	1·10	0·83–0·95	0·89
Genitalia (1)	0·53	—	—	—
Total (10)	1·82–2·05	1·96	—	—
C.I. (14)	1·05–1·13	1·10	—	—

Female

	Length		Breadth	
	Range	Mean	Range	Mean
Head (23)	0·58–0·67	0·61	0·64–0·73	0·68
Prothorax (10)	—	—	0·35–0·42	0·39
Pterothorax (10)	—	—	0·57–0·65	0·60
Abdomen (10)	1·18–1·48	1·34	—	—
Total (10)	2·08–2·68	2·35	—	—
C.I. (23)	1·09–1·13	1·11	—	—

Degeeriella gypsivorum Eichler, 1943

Type host : *Gyps himalayensis* Hume

Degeeriella gypsivorum Eichler, 1943. *Zool. Anz.* **142** : 93, fig. 2. Host : *Gyps himalayensis Hume.*

There is practically no description of this species : it is said to be somewhat smaller than *punctifer*, but no measurements are given and the preantennal region of the head is said to be parabolic in form, but there is no figure. The figure of the genitalia shows these structures to be similar to those of *punctifer*. Whether this is a good species, a subspecies or a synonym of *punctifer* must wait for an examination of the types or material from the type host.

SPECIES SEDIS INCERTAE

Philopterus aguiae Gervais, 1844

Philopterus (*Nirmus*) *agiae* Gervais, 1844. *In* Walkenaer's *Hist. nat. Ins.* **3** : 350. Host : *Spizaetus melanoleucus* = *Geranoaetus melanoleucus.*

It seems probable that the specimen from which Gervais made his description of *Philopterus aguiae* did not belong to the *Degeeriella.* In the description he states that the head is twice the breadth of the thorax, but in the *Degeeriella* species from *Geranoaetus* the head is not twice the breadth of the prothorax and certainly not of the pterothorax. Monsieur Brin of the Muséum National d'Histoire Naturelle in Paris has kindly told me that there is none of Gervais's type material in that Museum ; and it is most probably no longer in existence. Specimens from *Geranoaetus melanoleucus* are the same as those from *Aquila,* namely *D. fulva.* It does not seem reasonable to replace the established name *fulva* by *aguiae* which doubtfully refers to a *Degeeriella* and which has never been in general use. The name *Philopterus aguiae* Gervais will, therefore, be submitted to the International Commission on Zoological Nomenclature as a *nomen dubium* for inclusion in the Official Index of Rejected and Invalid Specific Names in Zoology. While this is under consideration by the Commission the name *aguiae* should not be used to replace *fulva.*

Nirmus kunzei Giebel, 1874

Nirmus kunzei Giebel, 1874. *Insecta epizoa* : 125. Host : *Falco tinnunculus.*

This species was described from a single female specimen said to have been taken from *Falco tinnunculus* ; according to the original description the specimen was quite different from *rufa.* The type is lost and the original specimen was probably a straggler, and as the species is not identifiable from the description this name should be discarded as a *nomen dubium.*

Nirmus stenorhynchus Giebel, 1874

Nirmus stenorhynchus Giebel, 1874. *Insecta epizoa* : 129. Host : *Milvus aetolius.*

This species said to have come from *Milvus* is not the same as *regalis* and is impossible to identify from the original description. It is presumably a straggler, perhaps not even from one of the Falconiformes and as the type is lost this name will be submitted to the International Commission on Zoological Nomenclature for inclusion in the Official Index on Zoological Names as a *nomen dubium.*

Nirmus secondaria Osborn, 1896

Nirmus secondaria Osborn, 1896. *Bull. U.S. Bur. Ent.* (N.S.) **5** : 227. Host : *Corvus americanus.*

It is not possible to assign this species with certainty to the *Degeeriella* ; if the types are no longer in existence the name should be discarded as a *nomen dubium.*

Degeeriella masumae Ansari, 1955

Degeeriella masumae Ansari, 1955. *Proceedings VIIth Pakistan Sci. Conf.*, Biology : 42. Host : *Falco jugger* Gray.

Degeeriella splendidus Ansari, 1955

Degeeriella splendidus Ansari, 1956. *Proceedings VIIth Pakistan Sci. Conf.*, Biology : 42. Host : *Cerchneis tinnunculus interstinctus* McClell = *Falco tinnunculus interstinctus* Horsfield.

Both *D. masumae* and *D. splendidus* were published twice as sp. n. : once in the reference given above ; and again in *Indian Journ. Entom.* **17** (1955) : 395, 1956, when the name was changed to *splendens*. There are no figures and the descriptions of the male genitalia make it doubtful whether these belong to the genus *Degeeriella* at all.

Key to the Species of *Degeeriella* Parasitic on the Falconiformes

1		Three marginal temporal setae elongated, remainder minute ; postantennal dorsal sutures present. (Head index more than 0·94)	*punctifer*
–		Two marginal temporal setae elongated ; postantennal sutures absent	2
2	(1)	Head index more than 0·94	3
–		Head index less than 0·90	4
3	(2)	Tergocentral setae of segments II–VIII total more than 46 ; shape of head diagnostic (Pl. 9, fig. 1)	*d. discocephalus*
–		Tergocentral setae of segments II–VIII total less than 44 ; shape of head diagnostic (Pl. 9, fig. 2)	*d. aquilarum*
4	(2)	Sternocentral setae of segments III–VI normally 4, never total more than 18	13
–		Sternocentral setae of segments III–VI normally 6 or more, never total less than 20. (Pleural setae present on segment IV)	5
5	(4)	Male without penial sclerite and with pleural setae on segment X ; female genital plate with median posterior prolongation	6
–		Without above characters	7
6	(5)	One seta each side of ventral endomeral arm ; head as in Text-figs. 126–128	*r. carruthi*
–		Two setae each side of ventral endomeral arm ; head as in Pl. 6, fig. 3	*r. rufa*
7	(5)	Males	8
–		Females	12
8	(7)	Anteriorly curved sclerite supporting penis each side (Text-fig. 56)	9
–		Genitalia not as above (Text-figs. 62–63)	11
9	(8)	Shape of dorsal endomeral plate as in Text-fig. 40	*r. deignani*
–		Shape of dorsal endomeral plate as in Text-fig. 39	10
10	(9)	Fused terga of IX–X considerably narrowed and arched medially (Pl. 5, fig. 1)	*r. regalis*
		Fused tega of IX–X not so narrowed and arched medially (Pl. 5, fig. 3)	*r. castanea** *r.* subsp.* (p. 191)
11	(8)	First segment of antenna enlarged, third with distal postaxial angle prolonged	*mookerjeei*
—		Antenna simple	*phlyctopygus*

* Shape of heads of males and females diagnostic, see figures and descriptions.

12	(7)	Inner genital sclerites fused or approximated medially (Text-fig. 80)	_r. regalis_
—		Inner genital sclerites separated medially	_r. deignani_* _r. castanea_* _r._ subsp.* _phlyctopygus_* _mookerjeei_*
13	(4)	Segment IV with one pleural seta each side (terga II–III indented medially)	_hopkinsi_
—		Segment IV without pleural seta	14
14	(13)	Segment V with one pleural seta each side	20
—		Segment V without pleural seta	15
15	(14)	Ventral carina with a definite flattened edge enteriorly, to which is attached lobe of pulvinus (Text-fig. 125); inner genital sclerites fused medially	16
—		Not as above	17
16	(15)	Penial sclerite not joined to penis; female genital plate with median posterior prolongation	_guimarãesi_
—		Not as above	_meinertzhageni_
17	(15)	Pleural thickening without well developed re-entrant heads	_leucopleura_
—		Pleural thickening of at least some segments with well developed re-entrant heads	18
18	(17)	Head broad and rounded anteriorly, breadth at temples: 0·47–0·52 mm.	_africana_
–		Head narrower and pointed anteriorly, breadth at temples: 0·36–0·41 mm.	19
19	(18)	Tergal plates apparent on segment XI of male; genitalia diagnostic (Text-figs. 36, 54)	_elani_*
—		Tergal plates not apparent on segment XI of male; genitalia diagnostic (Text-figs. 37, 53)	_tendeiroi_*
20	(14)	Ventral carina developed anteriorly each with a flattened inner edge. (Marginal temporal carinae broad; tergite III with at least an anterior concavity)	_elbeli_
—		Not as above	21
21	(20)	Tergite III without definite median indentation	22
—		Tergite III with definite median indentation	25
22	(21)	Ventral outline of pleural thickening approximately straight	23
—		Ventral outline of pleural thickening of at least some segments convex	24
23	(21)	Ventral suture reaches anterior margin of head; male genitalia diagnostic (Text-figs. 26, 42)	_fulva_
—		Ventral suture does not reach anterior margin of head; male genitalia diagnostic (Text-fig. 43)	_beaufacies_
24	(21)	Male genitalia diagnostic (Text-fig. 45)	_emersoni_
—		Male genitalia diagnostic (Text-fig. 44)	_carrikeri_
—		Male genitalia diagnostic (Text-fig. 101)	_rima_
25	(21)	Central area of tergite II round median indentation more strongly pigmented. (Shape of head and male genitalia diagnostic)	_fusca_
—		Not as above	26
26	(25)	Tergocentral setae on segments III–VIII, 4	27
—		Tergocentral setae on segments III–VIII, 6 or more	28
27	(26)	Head narrow, breadth at temples of males and females: 0·35–0·42 mm.	_n. haydocki_
—		Head broader, breadth at temples of single female: 0·47 mm.	_n. epustulata_
28	(26)	Tergite II with definite median slit	_n. nisus_* _n. vagans_*
—		Tergite II with at most shallow concavity	_n. frater_

* See footnote on previous page.

HOST-LIST
FALCONIFORMES

Host*	*Degeeriella* species	Species group	Page No.
Suborder CATHARTAE	No *Degeeriella.*		
Suborder FALCONES			
Superfamily SAGITTARIOIDEA	No *Degeeriella.*		
Superfamily FALCONOIDEA			
Family Accipitridae			
Subfamily Elaninae			
×*Elanus caeruleus*	*elani*	*elani*	174
E. notatus	,,	,,	
E. leucurus	,,	,,	
×*Chelictinia riocourii*	*meinertzhageni*	,,	176
Subfamily Perninae			
×*Elanoides forficatus*	*guimarãesi*	,,	177
×*Aviceda leuphotes*	*elbeli*	,,	172
×*Pernis apivorus*	*phlyctopygus*	*phlyctopygus*	193
×*Pernis ptilorhynchus*	*mookerjeei*	,,	194
Subfamily Milvinae			
×*Milvus milvus*	*r. regalis*	*regalis*	186
Milvus migrans			
Milvus lineatus			
×*Haliastur indus*	,, ×*r. deignani*	,, ,,	 190
Subfamily Accipitrinae			
×*Accipiter nisus*	*nisus nisus*	*fulva*	155
Accipiter striatus			
×*Accipiter gentilis*	*nisus vagans*	,,	157
Accipiter cooperii			
Accipiter badius	*nisus frater*	,,	158
Accipiter tachiro			
Accipiter virgatus			
×*Accipiter minullus*	*nisus haydocki*	,,	160
×*Accipiter bicolor*	*nisus epustulata*	,,	161
Melierax musicus	*fulva* +	,,	149
Melierax metabates	,, +	,,	149
Melierax gabar	?	,,	149
Geranoaetus melanoleucus	*fulva*	,,	144
Buteo rufinus			
Buteo rufofuscus			
Buteo hemilasius			
Buteo regalis			
Buteo jamaicensis	,, *r. regalis*	,, *regalis*	 186
Buteo harlani	*fulva*	*fulva*	144
Buteo lineatus			
Buteo buteo			
Buteo vulpinus			
Buteo burmanicus			
Buteo lagopus			
Buteo swainsoni	*regalis regalis*	*regalis*	186
Buteo galapagoensis	,, ,,	,,	

* Genera and species from which no *Degeeriella* have been seen are not included.
× Type host, + or subspecies.

Host*	*Degeeriella* species	Species group	Page No.
Parabuteo unicinctus	*emersoni*	*fulva*	154
×*Leucopternis polionota*	*carrikeri*	*fulva*	153
×*Kaupifalco monogrammicus*	*rima*	,,	150
×*Butastur teesa*	*beaufacies*	,,	152
Hypomorphnus urubitinga	?	,,	149
×*Buteogallus gundlachii*	*emersoni*	,,	154
Lophaëtus occipitalis	*fulva*+	,,	149
×*Stephanoaëtus coronatus*	*africana*	,,	151
Polemaëtus bellicosus	*fulva*+	,,	149
Hieraaëtus ayresii	*fulva*+	,,	149
×*Aquila chrysaëtos*	*fulva*	,,	144
	discocephalus	*discocephalus*	170
	aquilarum		
Aquila heliaca	*fulva*	*fulva*	144
	d. aquilarum	*discocephalus*	
Aquila rapax	*fulva*	—	
	d. aquilarum	*discocephalus*	
×*Aquila nipalensis*	,, ,,	,,	
Aquila clanga	*fulva*	*fulva*	
	d. aquilarum	*discocephalus*	
Aquila pomarina	*fulva*	*fulva*	
	d. aquilarum	*discocephalus*	
Aquila verreauxii	*fulva*	*fulva*	
Aquila wahlbergi	,,	,,	
×*Haliaeetus vocifer*	*r. castanea*	*regalis*	190
Haliaeetus pelagicus	*d. discocephalus*	*discocephalus*	168
Haliaeetus leucoryphus	*regalis*+	*regalis*	
Haliaeetus leucocephalus	*d. discocephalus*	*discocephalus*	168
×*Haliaeetus albicilla*	,, ,,	,,	
Icthyophaga ichthyaetus	*fulva*+	*fulva*	149
Subfamily AEGYPIINAE			
×*Gyps himalayensis*	? *gypsivorum*	*punctifer*	197
×*Gypohierax angolensis*	*r.* subsp.	*regalis*	191
×*Gypaëtus barbatus*	*punctifer*	*punctifer*	196
Subfamily CIRCINAE			
Circus cyaneus	*fusca*	*fulva*	162
Circus macrourus	,,	,,	
Circus pygargus	,,	,,	
Circus melanoleucus	,,	,,	
×*Circus aeruginosus*	,,	,,	
Subfamily CIRCAETINAE			
×*Terathopius ecaudatus*	*hopkinsi*	,,	164
Circaëtus gallicus	*leucopleura*	,,	165
Circaëtus gallicus	*leucopleura*	,,	
Circaëtus cinereus	,,	,,	
×*Circaëtus cinerascens*	,,	,,	
Spilornis cheela	?	,,	149
Family FALCONIDAE			
Subfamily POLIHIERACINAE			
Neohierax insignis	? (Host record needs confirmation)	*rufa*	
×*Gampsonyx swainsonii*	*tenderoi*	*elani*	77

Host*	*Degeeriella* species	Species group	Page No.
Subfamily FALCONINAE			
Falco biarmicus	*rufa*	*rufa*	180
Falco cherrug	,,	,,	
Falco mexicanus	,,	,,	
Falco jugger	,,	,,	
Falco rusticolus	,,	,,	
Falco peregrinus	,,	,,	
Falco subbuteo	,,	,,	
Falco cuvierii	,,	,,	
Falco eleonorae	,,	,,	
Falco concolor	,,	,,	
Falco hypoleucos	,,	,,	
Falco fuscocaerulescens	,,	,,	
Falco columbarius	,,	,,	
Falco ardosiaceus	,,	,,	
Falco vespertinus	,,	,,	
Falco amurensis	,,	,,	
Falco naumanni	,,	,,	
× *Falco tinnunculus*	*rufa rufa*	,,	
Falco alopex	*rufa*	,,	
× *Falco sparverius*	*r. carruthi*	,,	185
Ieracidea orientalis	*rufa*	,,	

HOST RELATIONSHIPS

It seems that the relationships of many of the Falconiformes are still the subject of considerable differences of opinion amongst ornithologists (Clay, 1957 : 146), and for this reason any evidence from the distribution of the parasites should be considered. However, as far as *Degeeriella* is concerned much of the evidence is difficult to interpret and only tentative suggestions of the relationship of the hosts can be made. Among the reasons for this are the following : (1) The rather close similarity of most of the species of *Degeeriella,* and the difficulty of judging the significance of the small character differences in relation to the time of separation of the populations and thus of their hosts. (2) The difficulty of knowing which of the species groups are the most primitive. It is not yet possible to describe with any certainty the form of the primitive mallophagen head. The different genera of Ischnocera usually resemble each other in the characters of the anterior margin of the head to a greater extent in the nymph than in the adult and as both nymph and adult live in the same environment, it can be presumed that the head with the complete anterior margin (as found in the majority of nymphs) is the more primitive. It is more difficult to decide whether the primitive Ischnocera had the complete semicircular central carina or the interrupted carina, with the two carinae passing to the anterior margin of the head. In *Degeeriella* the ventral carina is interrupted, but the two carinae are poorly developed anteriorly, except in the *elani* group and the nymphs of *D. rufa.* The nymph of *rufa* also has a dorsal preantennal suture delineating a semicircular dorsal anterior plate. It is not impossible, therefore, that the characters of the head of the *fulva* and *discocephalus* groups are secondary, even secondarily approaching the primitive condition, if the primitive Ischnoceran Mallophaga is presumed to have this type of head. Or alternatively, the species of the *elani* group are derived from a *discocephalus* type, but then it must be postulated that *rufa* shows a more primitive condition of the head in the adult than in the nymph. (3) The difficulty of distinguishing between primary and secondary absences of the species of *Degeeriella*. Was the *discocephalus* type evolved on a common ancestor of *Aquila* and *Haliaeëtus* after this became separated from other hawks? This would suggest a close relationship between these genera. Or did it once have a widespread distribution later becoming extinct except on these hawks? From the resemblance, perhaps of no significance, between the heads of the nymphs of *fulva* and the adults of *discocephalus* it is possible that these species were derived relatively recently from a common ancestor, suggesting an originally wider distribution for *discocephalus*. It is possible that some of the differences between the mallophagan faunas such as those of *Buteo galapagoensis* and *B. swainsoni* and the rest of *Buteo* is due to the extinction of a different member of an original sympatric pair (Clay, 1949 : 296). The *fulva, regalis,* and *discocephalus* types may all have been found on the ancestral Accipitridae and since become extinct on some or other of the present members of the family. However, even this may indicate relationships ; for instance the fact that *fulva* is not found on any of the genera included in the Milvinae suggests that it had already become extinct (if ever present) on an ancestral stock which gave rise to these genera and thus confirms their relationships.

As an indication of the relationships of the Falconiformes as accepted by at least some ornithologists the arrangement in Peters (1931) has been followed. On pp. 202–3 above is a list of hosts (arranged according to Peters) and their known species of *Degeeriella* together with the species groups to which these belong. It can be seen from this list that in general the distribution follows that of the arrangement of their hosts, but with some notable exceptions. The relationships between species of *Degeeriella* which seem to throw some light on the relationships of their hosts are discussed in the following paragraphs.

1. The *Degeeriella* from *Elanus, Chelictinia, Elanoides* and possibly *Aviceda* form a related group, with those from *Chelictinia* and *Elanoides* probably being the most nearly related. The species from *Gamsonyx,* and also possibly *Falco* and *Ieracidea,* all belonging to the family *Falconidae,* should perhaps be included in this group (Clay, 1958 : 2). The *Degeeriella* species from *Pernis* (a genus placed in the Perninae with *Elanoides* and *Aviceda*) are quite distinct and perhaps show affinities with those from the Milvinae.

2. The Milvinae are parasitized by a distinctive species of *Degeeriella* ; the supposition that this may be a relic of a sympatric pair has already been mentioned, and it is therefore possible that the Milvinae are in fact rather more nearly related to the Accipitrinae than their *Degeeriella* suggest.

3. The *Degeeriella* of the Accipitrinae suggest a fairly close relationship between the members of this subfamily, especially between *Aquila* and *Buteo* ; further that there is little difference between this subfamily and the Circinae, and that *Terathopius*

and *Circaëtus* (but not *Spilornis*) of the subfamily Circaetinae are similar but rather more distinct. *Buteo galapagoensis, B. swainsoni, Haliaeetus vocifer* and *H. leucoryphus* have the same species as found on *Milvus* (see above). *Aquila* and *Haliaeëtus* have a second species *discocephalus*, the resemblance of the nymphs of *fulva* to the adults of this species has already been mentioned and perhaps confirms the close relationship of *Buteo* and *Aquila* which is suggested by both being parasitized by *fulva*.

4. Few *Degeeriella* species are known from the Aegypiinae : *Gypaëtus* has a distinctive species (*punctifer*) not closely related to any other except *gypsivorum* from *Gyps himalayensis*. This would suggest that *Gypaëtus* and *Gyps* are wrongly placed between the Accipitrinae and the Circinae. Boetticher & Eichler (1954) considered that the *Degeeriella* species found on *Aquila* and *Gypaetus* showed a relationship between these hosts, but this was based on the erroneous assumption that *discocephalus* and *punctifer* were closely related, but the two species resemble each other only in shape. The *Degeeriella* of *Gypohierax* is a subspecies of *regalis*, rather near that of *Haliaeëtus vocifer*, this suggests if no secondary infestation has taken place, that *Gypohierax* is wrongly placed in the Aegypiinae.

5. It seems doubtful whether the genera included in the Falconidae do in fact, form a related group. As already shown the *Degeeriella* from *Gampsonyx* and possibly also *Neohierax, Falco* and *Ieracidea* show a relationship to those on some of the genera included in the Elaninae and Perninae. The subfamily Polyborinae do not have any species of *Degeeriella sens. str.* but are parasitized by a species of the closely related genus *Acutifrons*. The parasites of *Microhierax* and of *Polihierax*, belonging to the Polihieracinae, do not belong to *Degeeriella* and have been dealt with elsewhere (Clay, 1955).

A detailed study of the other genera of Mallophaga living on the Falconiformes may give some further indications of the relationships of their hosts.

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SUMMARY

The characters and distribution of the *Degeeriella*-complex are discussed. *Degeeriella sens. str.*, as found on the Falconiformes, is described. Variations and artefacts, characters of taxonomic importance and the concept of the subspecies in this group are considered. A systematic survey of all known species is given followed by a key and notes on names of which the correct interpretation is doubtful.

Finally some suggestions are made on possible relationships within the Falconiformes based on the distribution of the Mallophaga.

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PLATE 1

Figs. 1–7. *Degeeriella fulva* (♂♂) from various hosts :
  Fig. 1. *Aquila chrysaëtos.*
  Fig. 2. *Buteo lagopus.*
  Figs. 3–4. *Aquila wahlbergi.*
  Fig. 5. *Buteo buteo.*
  Fig. 6. *Buteo harlani.*
  Fig. 7. *Buteo jamaicensis.*

PLATE 2

Fig. 1. *Degeeriella africana.*
Fig. 2. *Degeeriella carrikeri.*
Fig. 3. *Degeeriella n. haydocki.*

PLATE 3

Fig. 1. *Degeeriella n. nisus.*
Fig. 2. *Degeeriella n. vagans.*
Fig. 3. *Degeeriella n. frater.* Lectotype.

PLATE 4

Fig. 1. *Degeeriella leucopleura.*
Fig. 2. *Degeeriella hopkinsi.*
Fig. 3. *Degeeriella fusca.*

PLATE 5

Fig. 1. *Degeeriella r. regalis* from *Milvus milvus.*
Fig. 2. *Degeeriella r. deignani.*
Fig. 3. *Degeeriella r. castanea.*

PLATE 6

Fig. 1. *Degeeriella elani.*
Fig. 2. *Degeeriella tendeiroi.*
Fig. 3. *Degeeriella rufa* from *Falco tinnunculus.*

PLATE 7

Fig. 1. *Degeeriella guimarãesi.*
Fig. 2. *Degeeriella meinertzhageni.*
Fig. 3. *Degeeriella elbeli.*
Fig. 4. Male genitalia of fig. 1.
Fig. 5. Male genitalia of fig. 2.
Fig. 6. Male genitalia of fig. 3.

PLATE 8

Fig. 1. *Degeeriella phlyctopygus.*
Fig. 2. *Degeeriella mookerjeei.*
Fig. 3. *Degeeriella fulva* from *Aquila chrysaëtos*, male genitalia.
Fig. 4. *Degeeriella beaufacies*, male genitalia.
Fig. 5. *Degeeriella n. nisus*, male genitalia.
Fig. 6. *Degeeriella fusca*, male genitalia.
Fig. 7. *Degeeriella rufa* from *Falco tinnunculus*, male genitalia.

PLATE 9

Fig. 1. *Degeeriella d. discocephalus* from *Haliaeetus albicilla.*
Fig. 2. *Degeeriella d. aquilarum* from *Aquila nipalensis.*
Fig. 3. *Degeeriella punctifer.*

Photographs by J. V. Brown
British Museum (Natural History)

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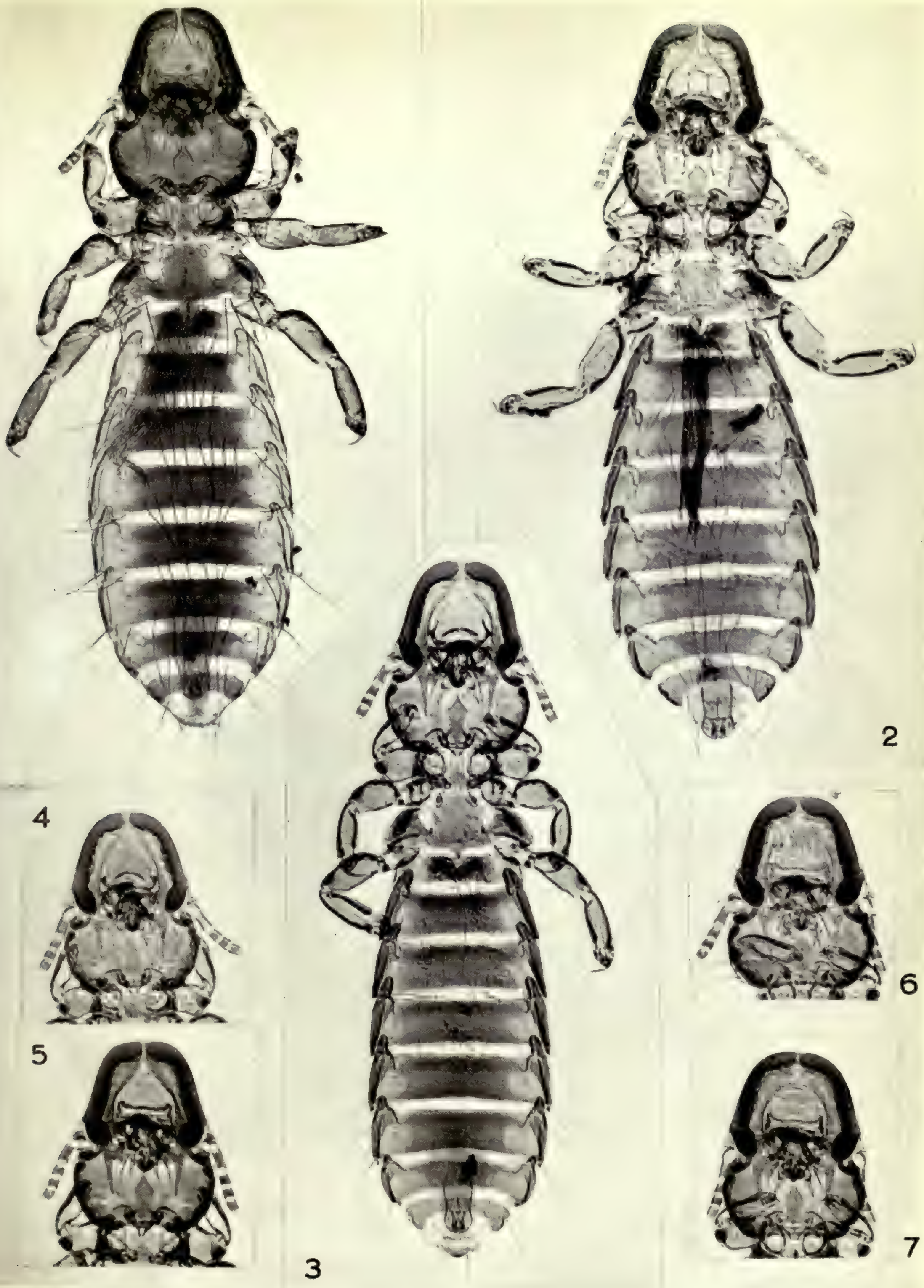
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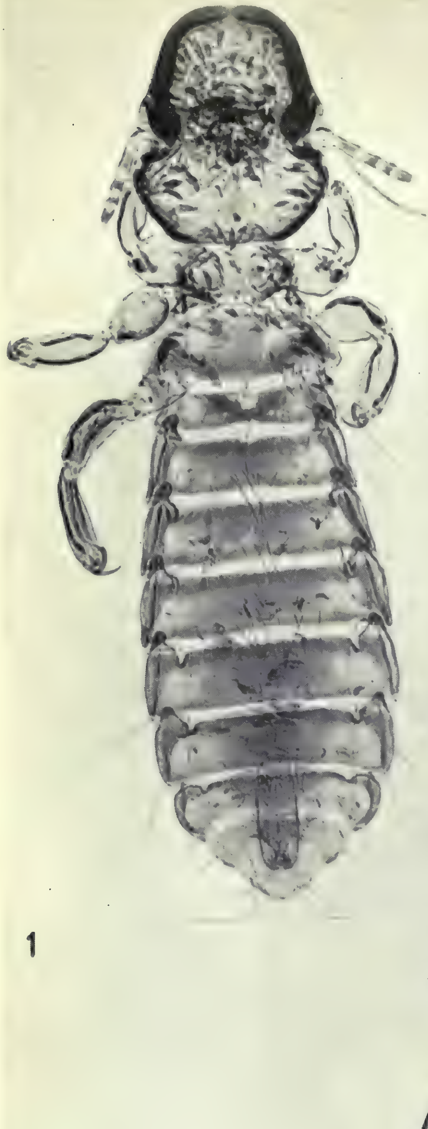
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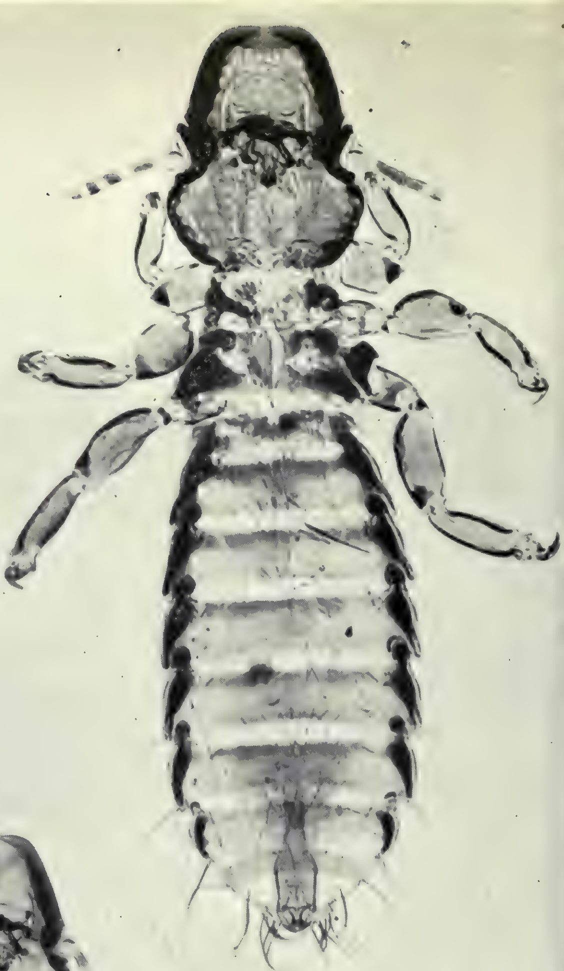
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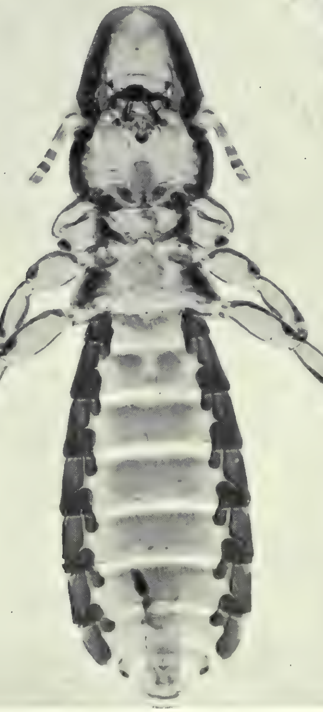
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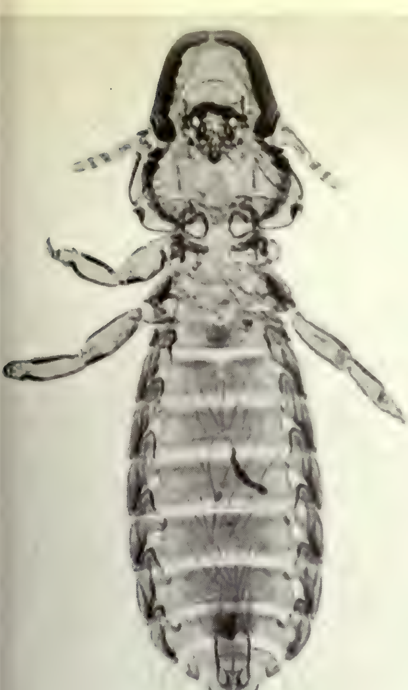

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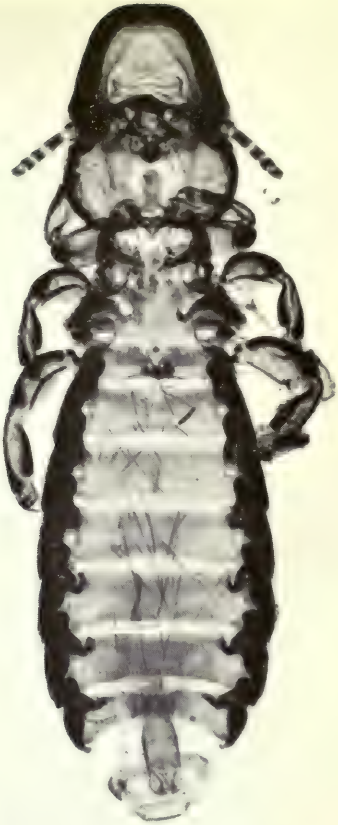

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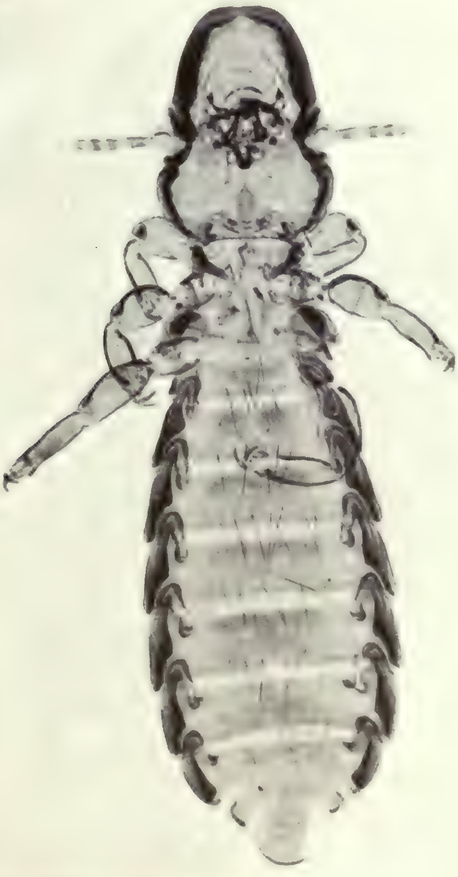

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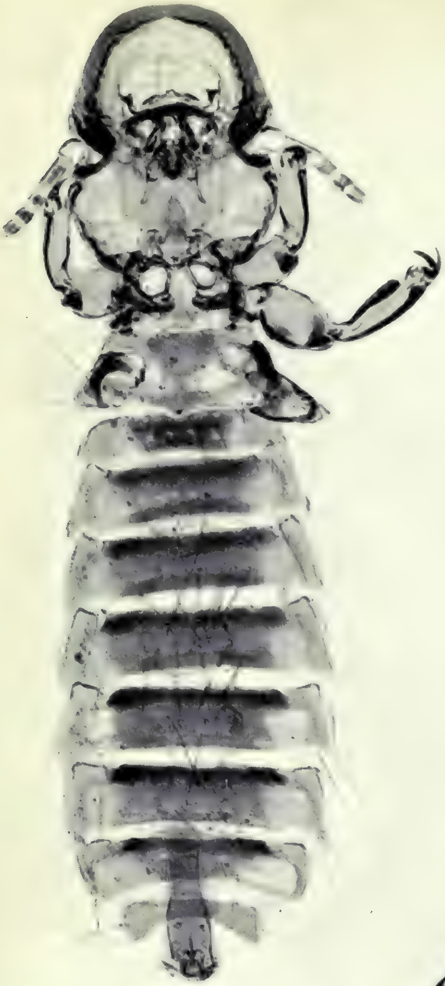

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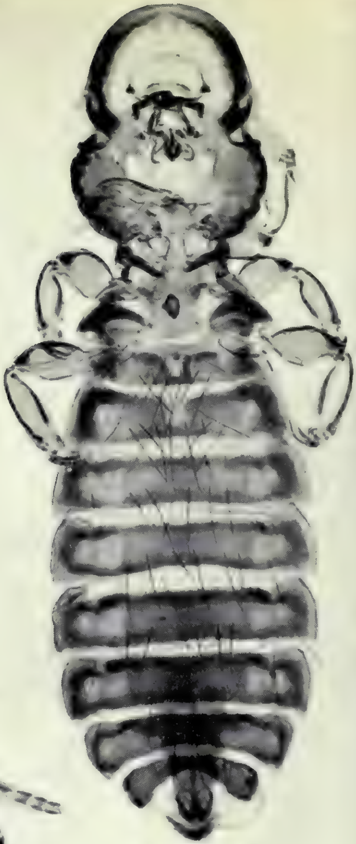

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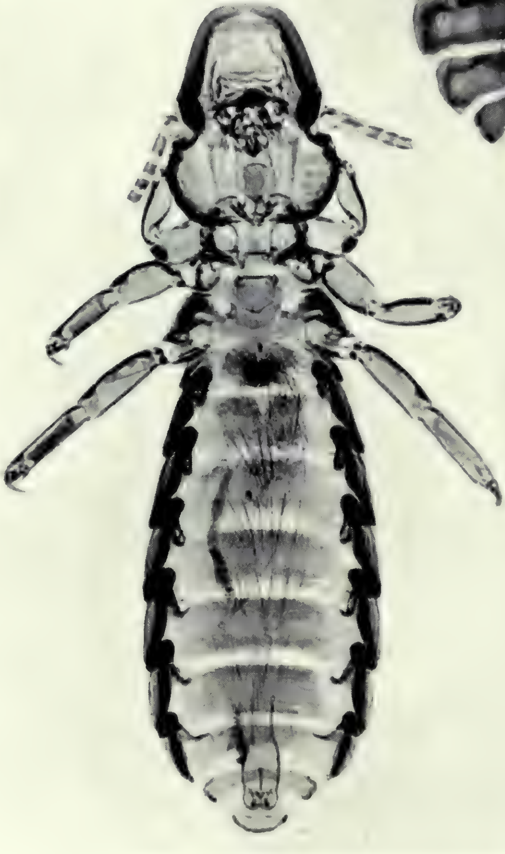

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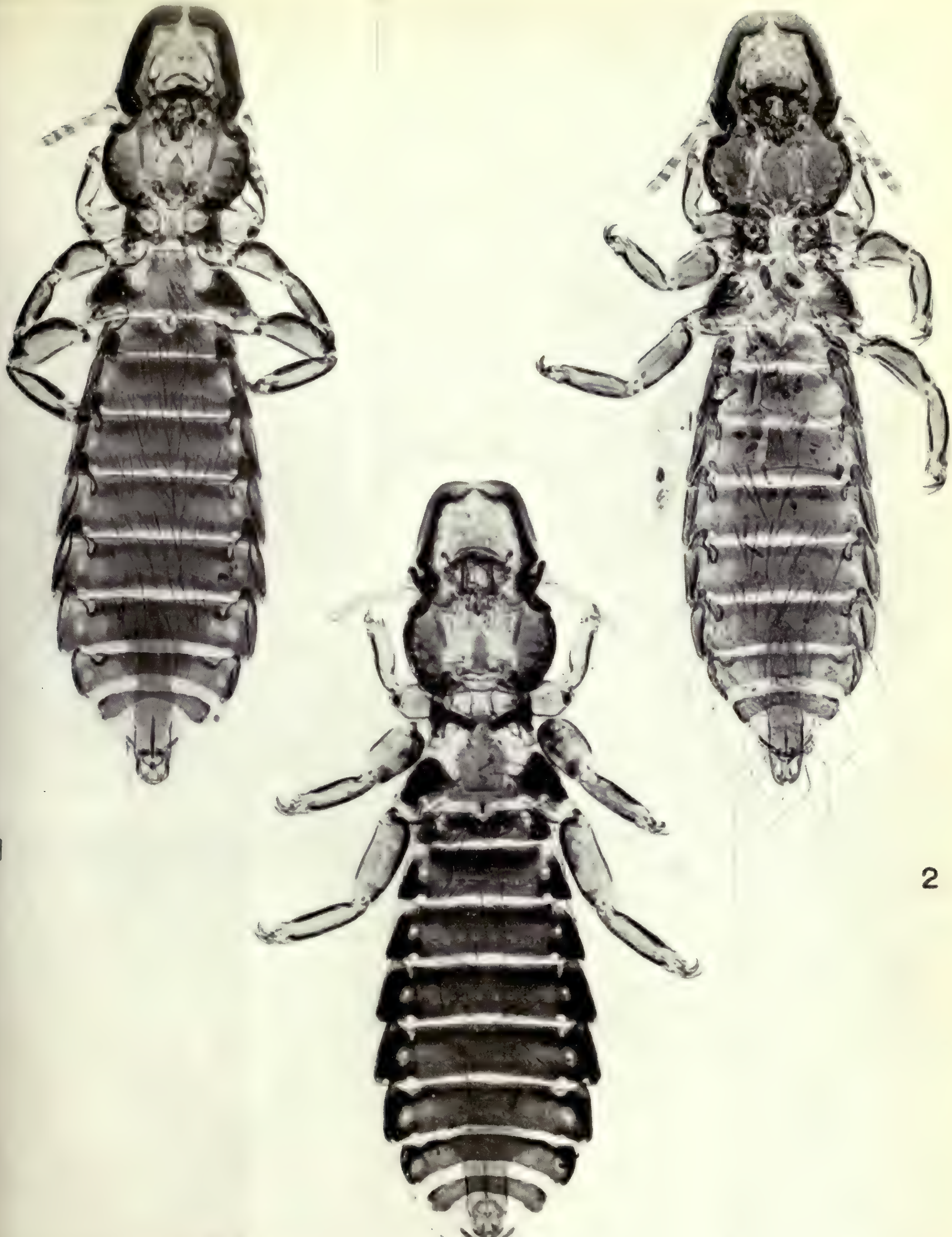
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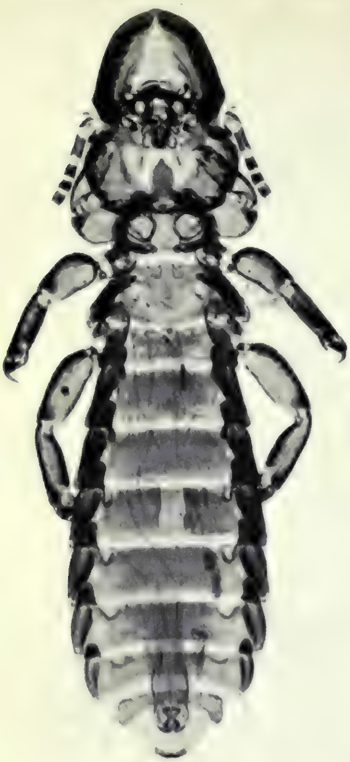

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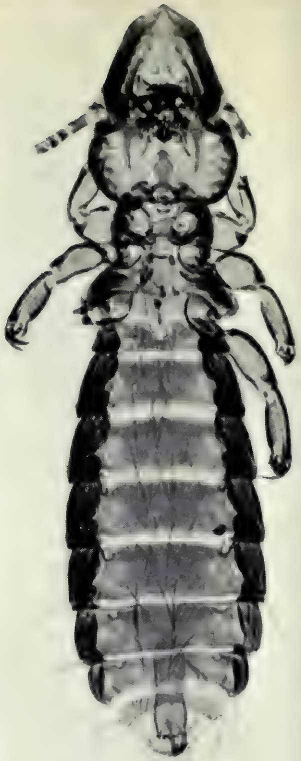

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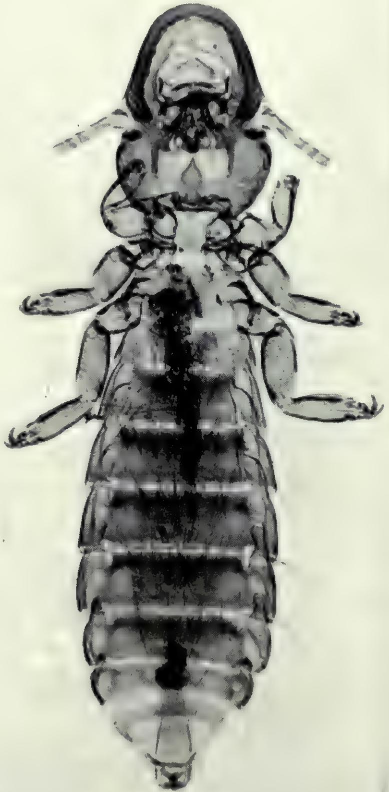

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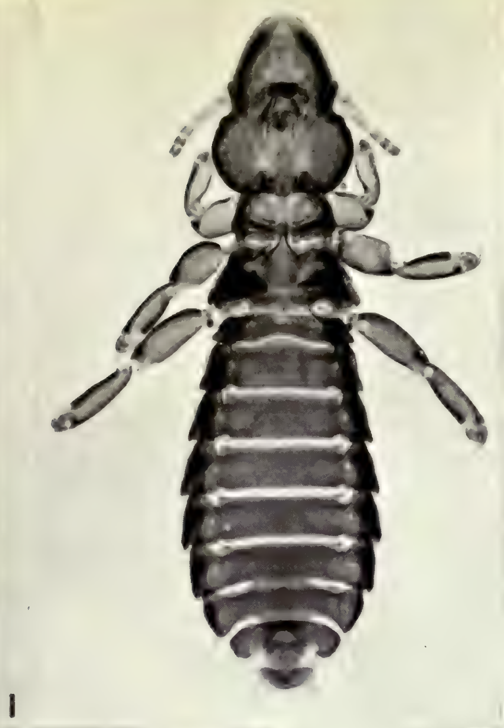
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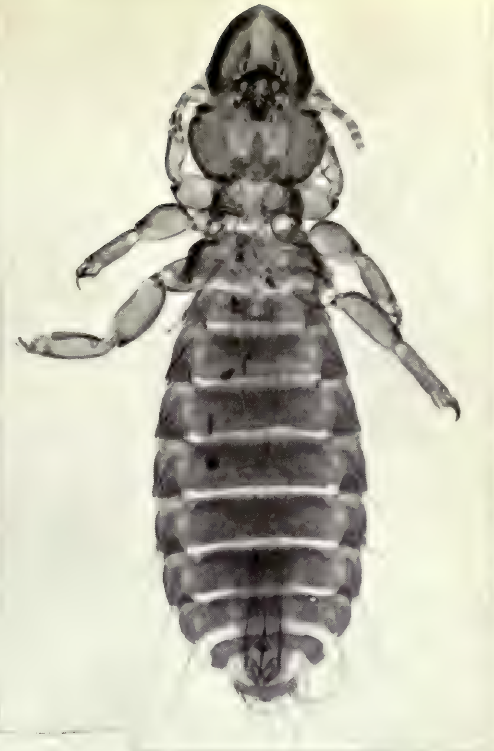
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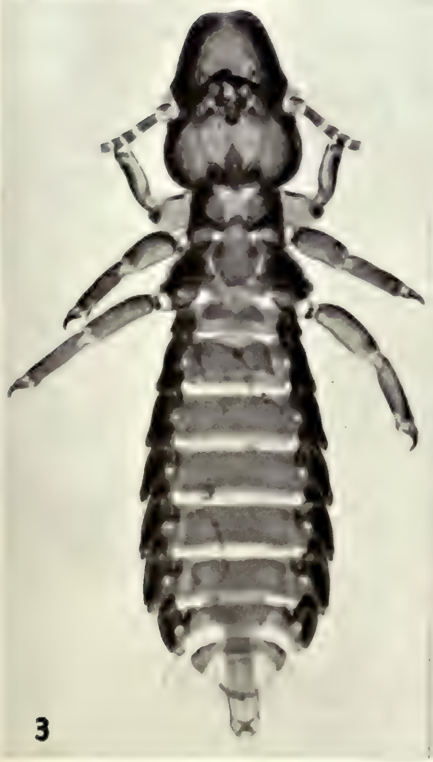
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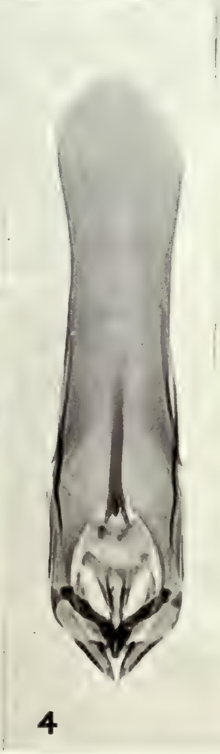
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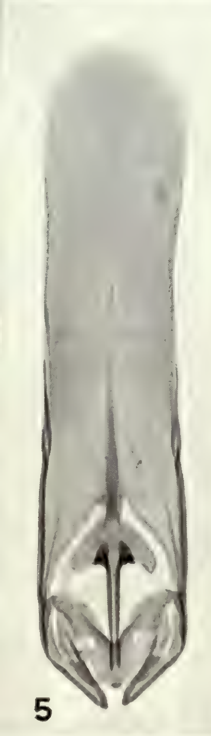
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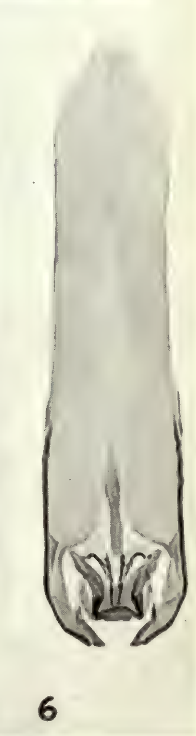
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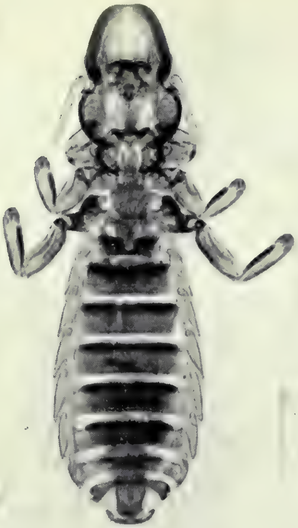
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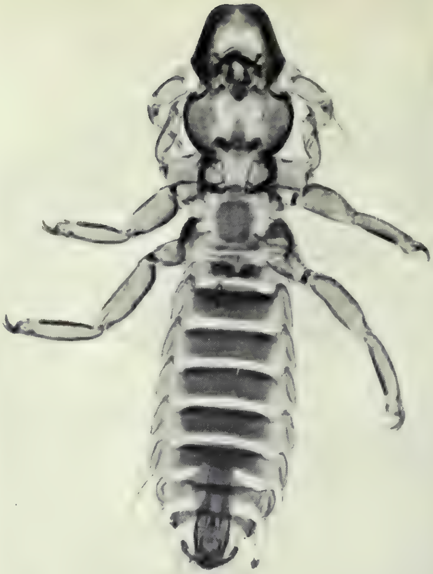
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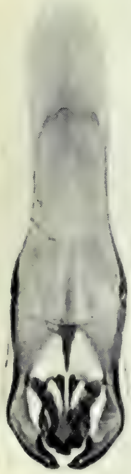
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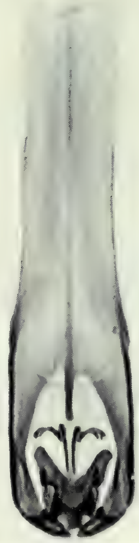
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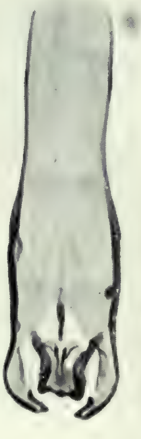
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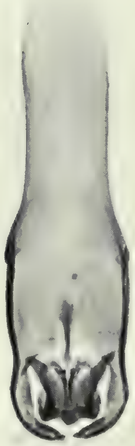
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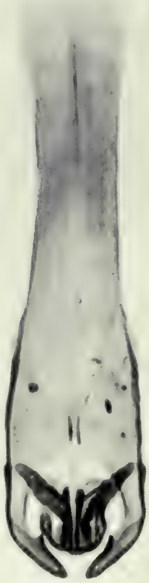
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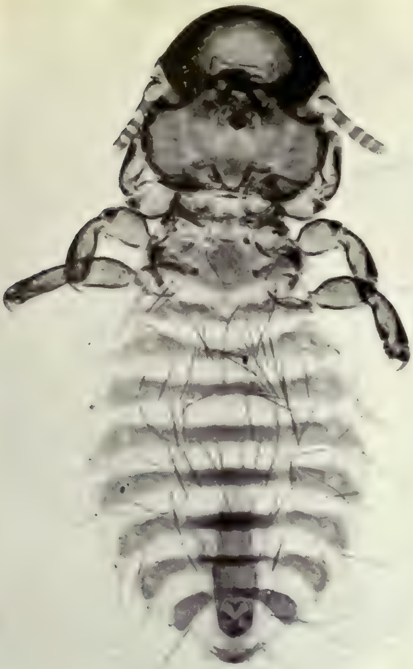

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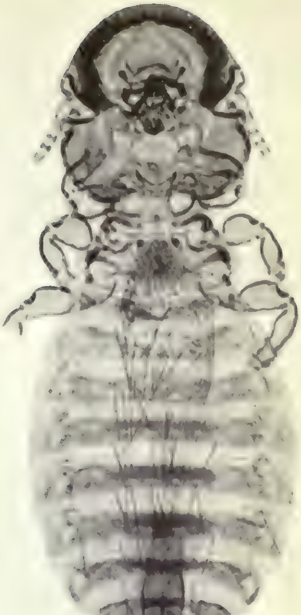

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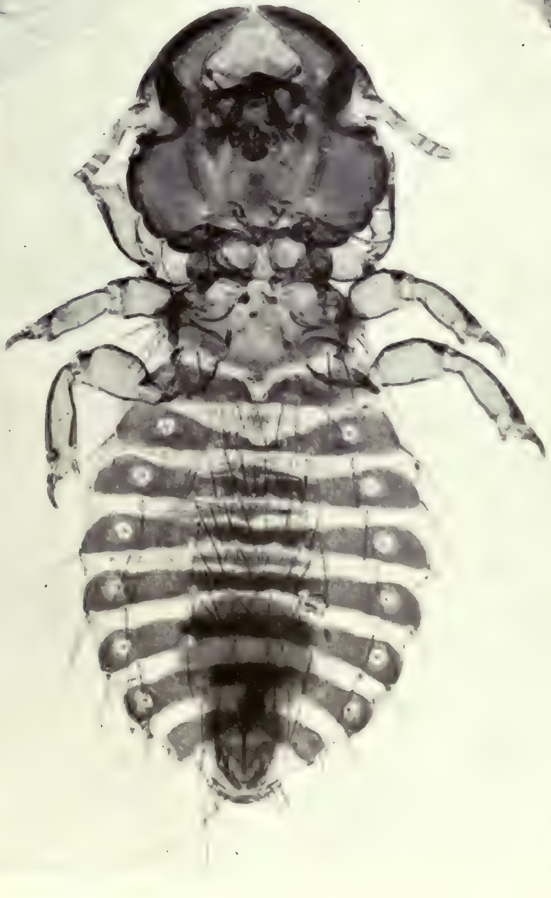

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BRITISH MUSEUM
1958
NATURAL HISTORY

RÉVISION DU GENRE *EXOCENTRUS* MULSANT (COL., CERAMBYCIDAE)

S. BREUNING

BULLETIN OF
THE BRITISH MUSEUM (NATURAL HISTORY)
ENTOMOLOGY Vol. 7 No. 5
LONDON: 1958

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Pp. 209–328; 5 *Text-figures*

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RÉVISION DU GENRE *EXOCENTRUS* MULSANT (COL., CERAMBYCIDAE)

Par S. BREUNING

Genus ***EXOCENTRUS*** Mulsant

Exocentrus Mulsant, 1839, *Col. Fr., Long.* : 152.
Exocentrus + *Camptomyme* Pascoe, 1864, *Trans. ent. Soc. Lond.* (3) **131** : 27, 43.
Oligopsis Thomson, 1864, *Syst. Cer.* : 111.
Exocentrus Mulsant, Bates, 1866, *Ann. Mag. nat. Hist.* (3) **17** : 191.
Exocentrus + *Oligopsis* + *Camptomyme* Lacordaire, 1872, *Gen. col.* **9** : 800, 801, 805, 806, 815.
Exocentrus Mulsant, Ganglbauer, 1884, *Best. Tab.* **7** : 692.
Ispaterus Fairmaire, 1892, *Rev. d'Ent.* **11** : 122.
Pseudocentrus Fairmaire, 1901, *Rev. d'Ent.* **20** : 230.
Exocentrus Mulsant, Matsushita, 1933, *Journ. Fac. Agr. Hokk.* **34** : 389.
Exocentrus Mulsant, Gressitt, 1939, *Lingn. Sc. Journ.* **18** : 82 ; 1940, *Philipp. Journ. Sc.* **72** : 182, 183 ; 1951, *Longicornia*, **2** : 518.
Exocentrus Mulsant, Lepesme & Breuning, 1955, *Bull. Soc. ent. Fr.* **60** : 127.

En ovale allongé ou allongé. Antennes normalement peu fines, un peu moins longues que le corps à modérément plus longues, frangées en dessous de poils longs ; le scape long et mince, le troisième article plus ou moins long que le quatrième ou que le scape, les articles à partir du cinquième diminuant progressivement en longeur. Tubercules antennifères non ou peu saillants. Yeux assez grossièrement facettés et fortement échancrés, les lobes inférieurs grands. Pronotum transverse, pourvu d'une épine latérale recourbée. Elytres plus larges que le pronotum, modérément convexes, normalement arrondis à l'apex, pourvus souvent de points sérialement disposés. Tête retractile. Saillie prosternale étroite, moins haute que les hanches, arquée. Saillie mesosternale peu large, inclinée vers l'avant. Métasternum de longueur normale. Cavités coxales intermédiaries fermées. Pattes de longueur moyenne ; fémurs claviformes ; tibias intermédiaires pourvus d'un léger sillon dorsal ; crochets divariqués. Tout les corps, les pattes et les antennes hérissés de poils dressés longs.

Type : *Exocentrus lusitanus* L. 259 espèces, répandues par l'Afrique, l'Europe, l'Asie et les Iles orientales vers l'est jusqu'aux Iles Carolines, la Nouvelle Guinée et le Queensland.

Mulsant, lors de sa description du genre *Exocentrus*, y avait placé deux espèces, *cinereus* Muls. et *lusitanus* L. Dans sa deuxième edition de ses *Coleoptères de France* parue en 1863 il avait placé lui même le *cinereus* dans son genre *Oplosia*. Ainsi *lusitanus* L. devient automatiquement par élimination le type du genre *Exocentrus*.

Les espèces suivantes décrites comme appartenant au genre *Exocentrus* Muls. sont à exclure du genre :

bioculatus Matsumura & Matsushita, *binhanus* Pic, *fujiyamai* Matsumura & Matsushita, *inhirsutus* Pic, *leiopodinus* Marsushita, *meridianus* Ohbayashi, *saipanensis* Ohbayashi et *tonsus* Bates, ces huit espèces se plaçant dans le genre *Aegocidnus* Pascoe.

antennalis Jordan et *polymitus* Jordan, ces deux espèces se plaçant dans le genre *Jordanoleiopus* Breuning.

elegans Fairmaire appartenant au genre *Parhoplomelas* Breuning.

inermis Gahan appartenant au genre *Acartus* Fahraeus comme synonyme de *hirtus* Fahraeus.

aurovilliusi Fisher appartenant au genre *Paroligopsis* Breuning.

hirsutulus Faldermann, espèce douteuse.[1]

setosus Serville appartenant au genre *Cosmotomoides* Melzer.

nitidulus Bates, *pusillus* Blanchard et *setosus* Serville appartenant à des genres americains.

Les genres *Camptomyme* Pascoe, *Oligopsis* Thomson et *Pseudocentrus* Fairmaire ne forment pas des genres à part mais peuvent être conservés comme noms de sousgenres. Je partage le genre *Exocentrus* en dix sousgenres me basant surtout aussi sur la longueur relative des premiers articles antennaires. Ces sousgenres ne forment souvent pas des groupes phylogéniquement homogènes mais facilitent le partage des très nombreuses espèces du genre qui ne sont généralement pas séparés par des cartères structurels importants. *Ispaterus* Fairmaire est un synonyme d'*Oligopsis* Thomson.

TABLEAU DE DÉTERMINATION DES SOUSGENRES

1. Troisième article des antennes moins long que le quatrième 2
– Troisième article des antennes tout au moins aussi long que le quatrième . . 5
2. Chaque élytre étiré en une épine apicale
Sg. 10, **Dentexocentrus** Breuning (une éspèce, p. 226)
– Elytres arrondis à l'apex 3
3. Troisième article des antennes moins long que le scape
Sg. 3, **Centenexocentrus** Breuning (Tableau, p. 221)
– Troisième article des antennes plus long que le scape 4
4. Antennes fines ; les points des élytres disposés sans ordre
Sg. 5, **Woodlarkexocentrus** Breuning (une éspece, p. 221)
– Antennes peu fines ; les points des élytres sérialement disposés
Sg. 4, **Barbierexocentrus** Breuning (une éspece, p. 221)
5. Troisième article des antennes aussi long que le quatrième 6
– Troisième article des antennes plus long que le quatrième 7

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[1] *Astyonomus hirsutulus* Faldermann, 1837, *Fna. Transcauc.* **2** : 272, pl. 8, fig. 5.
Astyonomus hirsutulus Ganglbauer, 1884, *Best. Tab.* **8** : 535.
Exocentrus hirsutulus Plaviltschikov, 1926, *Encycl. Ent.* **1**, Col. 2 : 60.
Plaviltschikov dit au sujet de cette espèce (l.c.) :
" *Exocentrus hirsutulus* Faldermann est sans doute un *Exocentrus* mais d'après la description et la figure données par Faldermann il est impossible de décider à quelle espèce de ce genre on doit attribuer cette description (probablement à l'*Exocentrus adspersus* Mulsant). Je propose de ne pas citer cette espèce dans la liste des espèces décrites et de la prendre comme un *nomen nudum* (à cause de sa description insuffisante)."

6. Les points des élytres sont plus ou moins alignés, sauf parfois dans le quart sutural Sg. 2, ***Camptomyme*** Pascoe (Tableau, p. 216)
– Les points des élytres sont disposés sans ordre Sg. 1, ***Exocentrus*** Mulsant *s. str.* (Tableau, p. 213)
7. Troisième article des antennes un peu plus long que le quatrième Sg. 6, ***Pseudocentrus*** Fairmaire (Tableau, p. 221)
– Troisième article des antennes beaucoup plus long que le quatrième . . . 8
8. Chaque élytre pourvu d'une petite bosse discale postbasilaire Sg. 9, ***Tuberculexocentrus*** Breuning (une éspèce, p. 323)
– Elytres sans trace d'une bosse discale 9
9. Les points des élytres sont sérialement disposés sauf parfois sur le tiers sutural Sg. 7 ***Oligopsis*** Thomson (Tableau, p. 225)
– Les points des élytres sont disposés sans ordre Sg. 8, ***Formosexocentrus*** Breuning (une éspèce, p. 322)

Tableau de Détermination des Espèces

1. Sousgenre *EXOCENTRUS* Mulsant *s.s.*

1. Elytres parsemés de très petites taches blanches, rangées longitudinalement. . 2
– Elytres sans taches semblables 7
2. Ces taches ne sont pas rangées en séries longitudinales régulières ***albomaculatus*** Pic (p. 234)
– Ces taches sont rangées en séries longitudinales régulières 3
3. Ces taches sont disposées en outre sous forme de deux bandes transversales, une prémédiane et une médiane . . . . . ***enganensis*** Breuning (p. 233)
– Ces taches ne sont pos disposées en forme de bandes transversales . . . 4
4. Ces taches sont disposées en cinq séries longitudinales sur chaque élytre ***lachrymosus*** Pascoe (p. 232)
– Ces taches sont disposées en sept séries longitudinales sur chaque élytre . . 5
5. L'épine latérale du pronotum faiblement recourbée . . ***lacteolus*** Gahan (p. 238)
– L'épine latérale du pronotum fortement recourbée 6
6. Cette épine est précédée d'une bosse latérale obtuse . . ***hageni*** Breuning (p. 233)
– Cette épine n'est pas précédée d'une bosse latérale ***pseudandamanensis*** Breuning (p. 234)
7. Pronotum et écusson rousseâtres 8
– Pronotum et écusson d'une autre couleur 12
8. Elytres revêtus de pubescence jaune pâle et marbrés de brun ***tesselatus*** Perroud (p. 236)
– Elytres couverts en majeure partie de pubescence brun foncé 9
9. Elytres avec de très petites taches blanchâtres disposées en forme de deux bandes transversales, une prémédiane et une postmédiane . ***albosticticus*** Breuning (p. 246)
– Elytres sans de taches pareilles 10
10. Quart apical de l'élytre revêtu d'une très fine pubescence grise ***ruficollis*** Lameere (p. 238)
— Quart apical sans pubescence grise 11
11. L'épine latérale du pronotum modérément recourbée. Elytres finement ponctués ***subruficollis*** Breuning (p. 239)
— L'épine latérale du pronotum fortement recourbée. Elytres très finement ponctués ***pseudoruficollis*** Breuning (p. 239)
12. L'épine latérale du pronotum à peine recourbée ***testudineus*** Matsushita (p. 229)
— L'épine latérale du pronotum toujours nettement recourbée 13
13. Chaque élytre orné de cinq bandes longitudinales jaunâtres peu larges, largement interrompues après le milieu . . . . . . ***bauhiniae*** Fisher (p. 232)
— Pubescence élytrale différente 14

14. Elytres avec nombreuses taches blanchâtres oblongues formant une sorte de bande médiane transversale et largement interrompues après le milieu **insulicola** Breuning (p. 232)
— Pubescence élytrale différente 15
15. Elytres couverts de pubescence grise et ornés de deux bandes transversales zigzaguées brunes, une médiane et une postmédiane . **klapperichi** Breuning (p. 236)
— Elytres sans ces dessins 16
16. Chague élytres avec une grande tache ou une bande transversale, postmédianes brunes 17
— Elytres sans ces dessins 36
17. Elytres ornés d'étroites bandes longitudinales blanchâtres sur la moitié antérieure et sur la partie apicale et de deux bandes transversales blanchâtres, une postbasilaire et une médiane . . . . . . **brevisetosus** Gressitt (p. 229)
— Elytres sans ces dessins 18
18. La tache postmédiane brune n'atteint pas le bord latéral 19
— Cette tache ou bande atteint le bord latéral 22
19. Lobes inférieurs des yeux aussi longs que les joues . . **parrotiae** Fisher (p. 236)
— Lobes inférieurs des yeux tout au moins deux fois plus longs que les joues . . 20
20. Cette tache est assez floue . . . . . . **occidentalis** Breuning (p. 245)
— Cette tache est très nette 21
21. Cette tache est prédédée de pubescence blanchâtre . **subplagiatus** Breuning (p. 242)
— Cette tache n'est pas précédée de pubescence blanchâtre . **plagiatus** Hintz (p. 242)
22. La tache ou la bande postmédiane brune est interrompue par de petites taches jaunes rangées sérialement 23
— Cette tache out bande non interrompue par de petites taches claires . . . 26
23. L'épine latérale du pronotum faiblement recourbée . . **adspersus** Mulsant (p. 227)
— L'epine latérale du pronotum fortement recourbée 24
24. Partie basilaire des articles antennaires à partir du troisième à pubescence jaune . 25
— Partie basilaire des ces articles non revêtue de pubescence jaune **decellei** Breuning (p. 241)
25. Troisième article des antennes aussi long que le premier **interruptefasciatus** Breuning (p. 238)
— Troisième article des antennes moins long que le scape **ugandicola** Breuning (p. 240)
26. Elytres parsemés sauf sur la bande postmédiane, de taches circulaires grises. . 27
— Elytres sans ces taches 28
27. Pronotum deux fois plus large que long . . . . . **albovarius** Fisher (p. 230)
— Pronotum transverse, mais pas deux fois plus large que long . **badius** Fisher (p. 230)
28. Lobes inférieurs des yeux presque trois fois plus longs que les joues . . . 29
— Lobes inférieurs des yeux à peine de moitié plus longs que les joues . . . 33
29. La bande postmédiane brune de l'élytre forme avec celle du deuxième élytre un grand *M* . . . . **asmarensis** Breuning (p. 239)
— Cette bande autrement formée 30
30. La bande postmédiane brune de l'élytre sensiblement amincie dans la zone suturale **savioi** Pic (p. 228)
— Cette bande très large aussi du côté sutural 31
Les taches jaunâtres de l'élytre condensées en trois larges bandes transversales, une postbasilaire, une médiane et une postmédiane . . **massarti** Breuning (p. 241)
— Elytres sans ces taches 32
[illegible] de très petites taches brunes disposées en séries longitudinales **punctipennis** Mulsant (p. 228)
— Elytres sans ces taches . . . . **galloisi** Matsushita (p. 228)
33. Sur chaque élytre en plus, deux assez grandes taches brun foncé, une basilaire à côté de l'écusson et une latérale prémédiane . . **fuscosignatus** Breuning (p. 242)
— Elytres sans ces taches 34

34. Elytres marbrés de blanchâtre dans la moitié basilaire et dans la région préapicale ***bialbomarmoratus*** Breuning (p. 243)
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35. Chacun des points situés entre la bande postmédiane et la bande préapicale est entouré d'un très petit cercle brun . . . . . ***stierlini*** Ganglbauer (p. 227)
— Ces points non entourés de cercles bruns . . . . . ***lusitanus*** Linnaeus (p. 226)
36. L'épine latérale du pronotum faiblement recourbée 37
— L'épine latérale du pronotum fortement recourbée 38
37. Troisième article des antennes un peu plus long que le scape ***transversifrons*** Fisher (p. 235)
— Troisième article des antennes à peine aussi long que le scape ***madecassus*** Fairmaire (p. 237)
38. Elytres ornés d'une bande médiane brune sur les élytres en forme de *M* . . 39
— Elytres sans une bande pareille 40
39. Elytres avec sept séries longitudinales de petites taches blanchâtres ***hallei*** Lepesme & Breuning (p. 243)
— Elytres sans ces taches . . . . ***m-fuscus*** Breuning (p. 244)
40. Elytres ornés de très petites taches ochracées nettes disposées en forme de deux bandes transversales, une postbasilaire et une postmédiane ***ochreopunctatus*** Breuning (p. 240)
— Elytres sans ces taches 41
41. Elytres avec une large bande transversale postmédiane floue rouge foncé . . 42
— Elytres sans cette bande 43
42. Partie basilaire des articles antennaires 3 à 10 à pubescence blanchâtre ***beesoni*** Fisher (p. 235)
— Partie basilaire de ces articles sans pubescence blanchâtre . ***echimys*** Pascoe (p. 231)
43. Elytres ornés d'une large bande transversale postmédiane noirâtre et de deux autres bandes pareilles, une basilaire et une apicale . ***trinigrovittatus*** Breuning (p. 239)
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44. L'épine latérale du pronotum assez longue 45
— L'épine latérale du pronotum comparativement courte 54
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— Elytres sans bande préapicale blanchâtre . . . . ***josephi*** Duvivier (p. 240)
47. Lobes inférieurs des yeux de moitié plus longs que les joues ***ziczac*** Breuning (p. 244)
— Lobes inférieurs des yeux trois fois plus longs que les joues . ***pici*** Breuning (p. 230)
48. Chaque élytre avec une bande transversale jaune pâle au tiers apical ***philippinus*** Fisher (p. 231)
— Elytres sans cette bande 49
49. Chaque élytre avec une étroite bande suturale jaune pâle tout au moins partiellement développée 50
— Elytres sans une bande semblable 53
50. Elytres ornés seulement de petites taches jaunes disposées en séries longitudinales 51
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— Ces taches ne s'arrètent pas de cette façon . . . . . ***suturalis*** Pic (p. 234)
52. L'épine latérale du pronotum fortement recourbée . ***sublineatus*** Breuning (p. 233)
— L'épine latérale du pronotum faiblement recourbée . . . ***lineatus*** Bates (p. 229)
53. Elytres couverts d'une fine pubescence grisâtre presque unicolore ***grisescens*** Jordan (p. 241)

— Elytres couverts de pubescence brun rougeâtre foncé et marbrés de jaune paille **erinaceus** Pascoe (p. 231)
54. Chaque élytre avec une bande transversale postmédiane zigzaguée blanche **freyi** Breuning (p. 244)
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2. Sousgenre ***CAMPTOMYME*** Pascoe

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– Elytres jamais bleu métallique 5
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– Tête et pronotum rouges 4
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– L'épine latérale du pronotum non précédée d'une bosse latérale ; élytres assez grossièrement ponctués . . . . **cyaneus** Breuning (p. 277)
4. Sur chaque élytre une large bande longitudinales sublatérale rouge **philippinensis transeuns** Breuning (p. 281)
– Elytres sans cette bande . . . . . . **philippinensis** Breuning (p. 281)
5. D'un rouge unicolore 6
– Jamais rouge unicolore 7
6. L'épine latérale du pronotum précédée d'une bosse latérale obtuse **rufus** Breuning (p. 257)
– L'épine latérale du pronotum non précédée d'une bosse . **subrufus** Breuning (p. 258)
7. Pronotum rouge unicolore ; élytres sans dessins 8
– Pronotum d'une autre couleur 12
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[illegible] 9
[illegible] **philippinensis unicolor** Fisher (p. 281)
[illegible] 10
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— Elytres brun foncé avec deux bandes transversales peu apparentes **explanatidens** Pic (p. 271)
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13. Lobes inférieurs des yeux aussi longs que les joues . . . **tristis** Pascoe (p. 282)
— Lobes inférieurs des yeux plus longs que les joues 14
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— Les points des élytres alignées aussi sur le quart sutural 16
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— Partie basilaire des fémurs noire . . . . . . **niger** Breuning (p. 257)
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— Lobes inférieurs des yeux deux fois plus longs que les joues 18
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— L'épine latérale du pronotum non précédée d'une bosse . **subnitens** Breuning (p. 250)
18. L'épine latérale du pronotum fortement recourbée . **subarmatus** Breuning (p. 249)
— L'épine latérale du pronotum faiblement recourbée **maiae** Lepesme & Breuning (p. 247)
19. Tête et pronotum noirs, élytres brun jaunâtres . . **subglaber** Fisher (p. 279)
— Corps autrement colorié 20
20. Elytres brun foncé, la région humérale et la région apicale rouges **humeralis** Aurivillius (p. 279)
— Autrement colorié 21

21. Elytres couverts de pubescence gris blanchâtre exception faite de deux bandes transversales glabres (brun foncé), une prémédiane et une postmédiane ***subbidentatus*** Gressitt (p. 273)
— Elytres autrement pubescents 22
22. Rouge. Elytres ornés de taches brun foncé vagues . ***vagemaculatus*** Breuning (p. 257)
— Autrement colorié 23
23. Elytres couverts de pubescence gris blanchâtre et ornés de taches brunes floues ***ciliatissimus*** Gressitt (p. 283)
— Autrement colorié 24
24. Elytres ornés de taches quadrangulaires jaune pâle, rangées sous forme de deux très larges bandes transversales, une prémédiane et une postmédiane 25
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— Les points des élytres sont sérialement disposés aussi sur le tiers sutural 26
26. Les taches de la deuxième bande restent distantes de l'apex ***misellus*** Lameere (p. 275)
— Les taches de la deuxième bande s'étendent jusqu'à l'apex de l'élytre ***miselloides*** Breuning (p. 282)
27. Chaque élytre avec trois bandes transversales jaunes 28
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— Sur chaque élytre une bande postbasilaire, une prémédiane et une postmédiane ***trifasciellus*** Gressitt (p. 272)
29. Sur chaque élytre deux bandes transversales ondulées jaunes 30
— Elytres sans ces bandes 31
30. Sur chaque élytre une bande prémédiane et une préapicale ***gedeensis*** Breuning (p. 278)
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31. Elytres ornés de bandes transversales blanchâtres ou gris clair ou du moins de petites taches blanchâtres ou gris clair disposées sous forme de bandes transversales 32
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— Elytres autrement dessinés 33
33. Elytres ornés de nombreuses petites taches ovalaires blanches ne formant pas de bandes nettes 34
— Elytres autrement dessinés 35
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— Lobes inférieurs des yeux quatre fois plus longs que les joues ***submoerens*** Breuning (p. 274)
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— Elytres avec des taches ou des bandes blanches dans la moitié apicale 43
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— Ces deux bandes non reliées près de la suture ***ruficornis*** Hintz (p. 252)
38. Les trois premiers articles antennaires rouge clair . ***nitens*** Jordan (p. 250)
— Les trois premiers articles antennaires brun foncé 39
39. Partie basilaire des articles antennaires à partir du troisième à pubescence blanchâtre ***pseudonitens*** Breuning (p. 266)
— Partie basilaire des ces articles sans pubescence blanchâtre 40
40. Bord latéral du pronotum largement aplati et rebordé . ***explanatidens*** Pic (p. 271)
— Bord latéral du pronotum non largement aplati et rebordé 41

41. Hanches et partie basilaire des fémur, noirs ***chevangeoni*** Lepesme & Breuning (p. 247)
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42. L'épine latérale du pronotum précédée d'une bosse latérale obtuse ***nigrescens*** Breuning (p. 258)
— L'épine latérale du pronotum non précédée d'une bosse ***schoutedeni*** Breuning (p. 259)
43. Les taches blanches forment dans la moitié postérieure de l'élytre un grand demi-cercle dont le point le plus convexe touche la suture ***multiguttulatus*** Pic (p. 275)
— Elytres autrement dessinés 44
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— Les poils dressés des élytres sont dorés . . . . ***aureopilosus*** Breuning (p. 267)
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— Sur chaque élytre une bande basilaire ou postbasilaire, une prémédiane et une postmédiane 54
50. Elytres très grossièrement ponctués . . ***grossepunctatus*** Breuning (p. 261)
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51. Sur chaque élytre après la bande préapicale une tache apicale jaune ***multivittatus*** Breuning (p. 256)
— Elytres sans tache apicale jaune 52
52. Chaque élytre avec une étroite bande suturale blanche sur le quart basilaire ***birmanus*** Breuning (p. 271)
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53. Ecusson couvert de pubescence blanche . . . ***alboscutellaris*** Breuning (p. 271)
— Ecusson sans pubescence blanche . . . . . . ***carissae*** Fisher (p. 270)
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— La bande prémédiane ne remonte pas obliquement en direction de l'épaule . . 56
55. La deuxiè mebande de l'élytre est une bande postmédiane ***rhodesianus*** Breuning (p. 262)
— La deuxième bande de l'élytre est une bande préapicale . ***conradti*** Breuning (p. 251)
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57. Tête rouge . . . . ***explanatidens*** Pic (p. 271)
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— L'épine latérale du pronotum fortement recourbée 61
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— La bande postmédiane de l'élytre est droite ***subinclusus latefasciatus*** Hunt & Breuning (p. 265)
61. La bande postmédiane de l'élytre est peu large et ondulée 62
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— Corps entièrement rouge clair . . . . ***minimus*** Breuning (p. 248)

63. Chaque élytre avec trois bandes transversales . . . ***strigosus*** Jordan (p. 251)

— Chaque élytre avec seulement deux bandes transversales ***latefasciatipennis*** Breuning (p. 248)

64. L'épine latérale du pronotum fortement recourbée et précédée d'une bosse latérale obtuse . . . . ***sjöstedti*** Breuning (p. 265)

— L'épine latérale du pronotum faiblement recourbée et non précédée d'une bosse latérale . . . . ***decorsei*** Breuning (p. 249)

65. Elytres ornés de bandes longitudinales grises interrompues par places ***insularis*** Fisher (p. 281)

— Elytres autrement dessinés 66

66. Elytres ornés de nombreuses étroites bandes longitudinales blanches on jaune pâle 67

— Elytres sans bandes pareilles 73

67. Les bandes blanches confluent plus ou moins latéralement sur la moitié latérale de l'élytre . . . . ***kalshoveni*** Fisher (p. 277)

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— Pronotum non rouge . . . . ***albostriatus*** Hintz (p. 255)

70. L'épine latérale du pronotum précédée d'une bosse latérale obtuse ***leucostriatus*** Breuning (p. 255)

— L'épine latérale du pronotum non précédée d'une bosse latérale 71

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— Tiers apical des tibias non brun foncé . . . . ***leucolineatus*** Breuning (p. 256)

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— L'épine latérale du pronotum non précédée de proéminences ***fuscovittatus*** Breuning (p. 267)

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— Elytres sans taches ochracées 80

80. Les taches élytrales blanches sont étroites . . . ***drescheri*** Fisher (p. 278)

— Les taches élytrales blanches sont oblongues . . . ***angusticollis*** Fisher (p. 280)

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84. Scape rouge clair 85
— Scape rouge foncé ou brun noir . . . . . ***chatterjeei*** Fisher (p. 270)
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— Pronotum moins large . . . . . ***subseriatus*** Breuning (p. 263)
87. Elytres ornés de très nombreuses taches quadrangulaires blanches qui couvrent pratiquement toute leur surface exception faite de taches minimes dénudées ***variegatus*** Duvivier (p. 260)
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— Elytres sans ces taches 91
89. Des taches pareilles se trouvent aussi sur le tiers apical ***albosignatus*** Lepesme & Breuning (p. 253)
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— Les deux premiers articles antennaires sont brun foncé ***albostictipennis*** Breuning (p. 260)
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— Elytres assez finement ponctués 95
93. Tibias unicolores rouges . . . . . ***rufotibialis*** Breuning (p. 246)
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— Epaules non rouges . . . . . ***exiguus*** Gahan (p. 262)
95. Sur chaque élytre une large bande longitudinale latérale brun foncé parcourant les deux tiers antérieurs 96
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96. Moitié basilaire des articles antennaires à partir du troisième à pubescence blanche ***orientalis*** Breuning (p. 265)
— Seule l'extrême base des articles antennaires à partir du troisième à pubescence blanche . . . . . ***guineensis*** Breuning (p. 246)
97. Premiers articles antennaires rouge clair . . . ***rufobasicornis*** Breuning (p. 258)
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— La bande postmédiane brune de l'élytre est ondulée 100
99. Pronotum avec deux taches dorées . . . . ***latevittipennis*** Breuning (p. 256)
— Pronotum sans taches dorées . . . . . ***jeanneli*** Breuning (p. 266)
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— Bord latéral de l'élytre garni de poils dressés noirs 102
101. Lobes inférieurs des yeux trois fois plus longs que les joues ***raffrayi*** Breuning (p. 268)
— Lobes inférieurs des yeux à peine deux fois plus longs que les joues ***gardnerianus*** Breuning (p. 266)
102. La bande postmédiane foncée de l'élytre interrompue par de petites taches circulaires jaunâtres . . . . . ***fasciolatus*** Bates (p. 274)
— La bande postmédiane foncée de l'élytre non interrompue par des taches ***subfasciatus*** Jordan (p. 253)
103. Elytres couverts d'une pubescence jaune pâle ou brun jaunâtre sauf une très grande tache latérale médiane ou postmédiane brune 104

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— L'épine latérale du pronotum fortement recourbée 105
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— Tête rouge 107
106. Pronotum noir . . . . **nigricollis** Hintz (p. 269)
— Pronotum brun rouge . . . . **constricticollis** Gressitt (p. 273)
107. Les points des élytres régulièrement alignés dans le quart sutural **ficicola** Fisher (p. 270)
— Les points des élytres non alignés dans le quart sutural . **murinus** Breuning (p. 264)

3. Sousgenre *CENTENEXOCENTRUS* nov.

1. Sur chaque élytre une grande tache postmédiane dénudée 2
— Elytres sans cette tache 3
2. Tiers apical des tibias à pubescence brun foncé . . **centenes** Pascoe (p. 286)
– Tiers apical des tibias sans cette pubescence . . **centenoides** Breuning (p. 286)
3. Elytres ornés de dessins blanchâtres sauf sur l'emplacement d'une tache ou bande transversale postmédiane brune 4
– Elytres autrement dessinés 9
4. Pronotum avec deux grandes taches discales jaunes . **hispidulus** Pascoe (p. 284)
– Pronotum sans ces taches 5
5. L'épine latérale du pronotum fortement recourbée 6
– L'épine latérale du pronotum seulement assez faiblement recourbée . . . 8
6. L'épine latérale du pronotum dirigée directement vers l'arrière **mindanaoensis** Fisher (p. 286)
– L'épine latérale du pronotum dirigée obliquement vers l'arrière 7
7. Pronotum deux fois plus large que long . . **seriatopunctatus** Aurivillius (p. 285)
– Pronotum faiblement transverse . . . . . . **artocarpi** Fisher (p. 286)
8. Troisième article des antennes aussi long que le scape. **hispiduloides** Breuning (p. 285)
– Troisième article des antennes sensiblement moins long que le scape **neopomerianus** Breuning (p. 285)
9. Les deux premiers articles antennaires brun noir . **bicoloripennis** Breuning (p. 287)
– Les deux premiers articles antennaires rouge clair **rufobasiantennalis** Breuning (p. 287)

4. Sousgenre *BARBIEREXOCENTRUS* nov.

Une seule espèce . . . . **barbieri** Pic (p. 288)

5. Sousgenre *WOODLARKEXOCENTRUS* nov.

Une seule espèce . . . . **woodlarkianus** Breuning (p. 288)

6. Sousgenre *PSEUDOCENTRUS* Fairmaire

1. Elytres d'un bleu métallique, rouge clair sur une tache humérale et sur une tache apicale . . . . **rufohumeralis** Breuning (p. 290)
– Elytres autrement coloriés 2
2. Elytres unicolores ou tout au moins sans dessins 3
– Elytres présentant toujours des dessins 22
3. Elytres rouges, mais à peu près la moitié suturale brun foncé ou noire. . . . 4
– Elytres autrement coloriés 5
4. Toute la moitié suturale de l'élytre noire . . **parterufipennis** Breuning (p. 291)
– Seuls les deux tiers antérieurs de la moitié suturale de l'élytre brun foncé **fisheri** Gressitt (p. 294)
5. Elytres noirs ou brun foncé, tout au moins en majeure partie 6

– Elytres rouges ou tout au moins plus clairs 13
6. Partie basilaire de l'élytre rouge 7
– Partie basilaire de l'élytre également brun foncé ou noir 8
7. Seul le huitième basilaire de l'élytre rouge ***testaceus rufobasipennis*** Breuning (p. 300)
– Tout le cinquième basilaire de l'élytre rouge ***testaceus rufoampliatus*** Breuning (p. 300)
8. D'un brun rougeâtre foncé unicolore . . . . . ***blötei*** Breuning (p. 290)
– D'une autre couleur 9
9. Tête noire 10
– Tête tout au moins partiellement rouge 11
10. Pronotum rouge à fine pubescence dorée . . . . . ***indicola*** Fisher (p. 306)
— Pronotum rouge foncé sans pubescence dorée . . . ***rufithorax*** Gressitt (p. 294)
11. Antennes unicolores brun noir . . . . . ***mindoroensis*** Breuning (p. 291)
— Articles antennaires annelés sur la partie basilaire de pubescence gris blanchâtre . 12
12. Front et joues d'un brun noir . . . . . ***testaceus diversiceps*** Pic (p. 300)
— Front et joues rouges . . . . . ***testaceus subbicolor*** Breuning (p. 300)
13. Pronotum brun foncé ou brun noir 14
— Pronotum rouge 19
14. Elytres rouges, brun foncé près de la suture sauf en arrière
testaceus lateraloides Breuning (p. 300)
— Elytres unicolores ou presque 15
15. Elytres d'un brun assez foncé, vaguement marbrés de blanc
crassepunctus Lepesme & Breuning (p. 313)
— Elytres brun rougeâtre clair ou bruns ou brun jaunâtre 16
16. Elytres grossièrement ponctués . . . . ***mirei*** Lepesme & Breuning (p. 312)
— Elytres finement ponctués 17
17. Elytres bruns . . . . . ***saitoi*** Matsushita (p. 294)
— Elytres jaunes 18
18. Troisième article des antennes un peu plus long que le scape ***zikaweiensis*** Savio (p. 295)
— Troisième article des antennes moins long que le scape ***immaculatus*** Gressitt (p. 293)
19. Pattes et antennes rouges 20
— Pattes et antennes noires 21
20. Lobes inférieurs des yeux fois plus longs que les joues . ***terminaliae*** Fisher (p. 304)
— Lobes inférieurs des yeux un peu plus longs que les joues . . ***ruficolor*** Pic (p. 295)
21. Les points des élytres sont disposés sans ordre . . . ***granulicollis*** Fisher (p. 301)
— Les points des élytres sont sérialement disposés sauf sur le quart sutural
testaceus Fisher (p. 299)
22. Elytres noirs avec des dessins blancs nets. 23
— Elytres autrement dessinés 24
23. Fémurs jaune rougeâtre . . . . . ***flemingiae*** Fisher (p. 299)
— Fémurs brun noir . . . . . ***fouqueti*** Pic (p. 296)
24. Elytres marbrés de jaune blanchâtre exception faite de quelques assez grandes taches postmédianes brun rougeâtre . . . . ***pilosicornis*** Fisher (p. 305)
— Elytres autrement dessinés 25
25. Elytres rouge foncé avec des taches blanchâtres floues sur le disque de la moitié antérieure et du tiers apical 26
— Elytres autrement dessinés 32
26. Tibias unicolores 27
— Moitié basilaire des tibias d'un rouge clair 31
27. Pronotum couvert de pubescence grise 28
— Pronotum sans pubescence grise . . . . ***actinophorae*** Fisher (p. 290)
28. Les taches élytrales sont assez grandes et disposées en séries longitudinales. . 29
— Les taches élytrales sont petites ou non disposées en séries longitudinales . . 30
29. L'épine latérale du pronotum précédée d'une bosse latérale obtuse
celebicus Breuning (p. 292)

— L'épine latérale du pronotum non précédée d'une bosse latérale ***mindoroanus*** Breuning (p. 291)
30. Les taches élytrales agglomérées pour former une bande transversale médiane ***tectonae*** Fisher (p. 289)
— Les taches élytrales non agglomérées pour former une bande transversale ***subreticulatus*** Breuning (p. 307)
31. Troisième article des antennes beaucoup moins long que le scape ***pubescens*** Fisher (p. 304)
— Troisième article des antennes â peine moins long que le scape ***gardneri*** Fisher (p. 304)
32. Chaque élytre avec une grande tache postmédiane brune ou brun foncé . . . 33
— Elytres sans cette tache 37
33. Sur chaque élytre aussi des taches brun foncé disposées en forme de bande transversale assez large . . . . ***nigronotatus*** Pic (p. 296)
— Elytres sans ces taches 34
34. Sur chaque élytre en plus deux taches ou bandes brun rouge ou noir, une basilaire et une apicale 35
— Elytres sans ces taches ou ces bandes 36
35. Ces taches ou bandes brun rougeâtre . . . . . ***collarti*** Breuning (p. 301)
— Ces taches ou bandes noires . . . . . . ***dalbergianus*** Gressitt (p. 294)
36. L'épine latérale du pronotum dirigée nettement vers l'arrière ***reticulatus*** Fairmaire (p. 306)
— L'épine latérale du pronotum dirigée obliquement vers l'arrière ***sumbawanus*** Breuning (p. 289)
37. Chaque élytre vaguement marbré de brun et de gris clair, avec une grande tache postmédiane suturale brune. . . . . . ***subgrisescens*** Breuning (p. 313)
— Elytres autrement dessinés 38
38. Elytres nettement marbrés d'ochracé sur fond d'un brun assez foncé ***alni***F isher (p. 301)
— Elytres autrement dessinés 39
39. Elytres revêtus de pubescence jaune grisâtre et ornés de taches longitudinales et transversales brunes . . . . ***tonkineus*** Pic (p. 296)
— Elytres autrement dessinés 40
40. Sur chaque élytre une étroite bande longitudinale brun foncé au bord latéral de la moitié antérieure 41
— Elytres sans une bande semblable 42
41. Cette bande rejoint en arrière une étroite bande transversale postmédiane ondulée brun foncé. . . . . ***sublateralis*** Breuning (p. 311)
— Elytres sans bande postmédiane transversale brun foncé. . ***lateralis*** Gahan (p. 308)
42. Elytres parsemés dans la moitié suturale des deux tiers antérieurs de taches blanchâtres et sur le restant de leur surface de taches jaune ocre ***ghesquierei*** Breuning (p. 313)
— Elytres autrement dessinés 43
43. Sur chaque élytre cinq ou six séries longitudinales de petites taches blanchâtres . 44
— Elytres sans taches semblables 48
44. Ces taches font défaut sur l'emplacement d'une bande transversale postmédiane. 45
— Ces taches ne font pas défaut sur une bande semblable 46
45. Antennes rouges, unicolores . . . . ***championi*** Fisher (p. 302)
— L'extrême base des articles antennaires à partir du quatrième à pubescence blanchâtre . . . . ***greviae*** Fisher (p. 303)
46. Lobes inférieurs des yeux de moitié plus longs que les joues ***alboseriatus*** Gahan (p. 298)
— Lobes inférieurs des yeux quatre fois plus longs que les joues 47
47. Rebord latéral du pronotum avant l'épine latérale largement ourlé ***marginicollis*** Fisher (p. 297)
— Le rebord latéral du pronotum non largement ourlé ***andamanensis*** Breuning (p. 298)

48. Chaque élytre orné de petites taches ochracées disposées en forme de deux bandes transversales, une postbasilaire et une postmédiane . ***tippmanni*** Breuning (p. 312)

— Elytres sans taches pareilles 49

49. Sur chaque élytre des bandes transversales blanchâtres souvent floues . . 50

— Elytres sans ces bandes 58

50. Sur chaque élytre quatre bandes transversales, une basilaire, une prémédiane, une postmédiane et une apicale . . . . . . ***monticola*** Fisher (p. 303)

— Sur chaque élytre trois bandes transversales, une postbasilaire ou prémédiane, une médiane ou postmédiane et une préapicale 51

51. Elytres assez grossièrement ponctués . . . . . ***dalbergiae*** Fisher (p. 302)

— Elytres finement ponctués 52

52. Partie basilaire des articles antennaires à partir du quatrième à pubescence blanche 53

— Partie basilaire de ces articles sans pubescence blanche 54

53. Ecusson à pubescence blanchâtre . . . . . . ***trifasciatus*** Fisher (p. 302)

— Ecusson à pubescence brune . . . . . . ***theresae*** Pic (p. 295)

54. La bande transversale postbasilaire et la bande prémédiane sont largement réunies ***binhensis*** Breuning (p. 297)

— Ces bandes non réunies 55

55. Les points sur les élytres sérialement disposés sauf sur le quart sutural ***cudraniae*** Fisher (p. 302)

— Les points sur les élytres non sérialement disposés 56

56. Les bandes élytrales sont assez nettes . . . . . ***santali*** Fisher (p. 305)

— Les bandes élytrales sont floues 57

57. L'épine latérale du pronotum mince ; troisième article des antennes un peu plus long que le scape . . . . . . ***malloti*** Fisher (p. 304)

— L'épine latérale du pronotum très large ; troisième article des antennes aussi long que le scape . . . . . . ***kuluensis*** Breuning (p. 306)

58. Elytres brun foncé chacun avec une bande transversale postmédiane ondulée blanchâtre . . . . . . ***seticollis*** Fisher (p. 303)

— Elytres autrement dessinés 59

59. Elytres avec de nombreuses petites taches jaunes ou gris jaunâtre disposées en séries longitudinales et souvent agglomérées en une étroite bande transversale ondulée médiane . . . . . . ***guttulatus*** Bates (p. 292)

— Elytres autrement dessinés 60

60. Sur chaque élytre une large bande transversale ochracée au tiers apical . . 61

— Elytres sans une bande pareille 62

61. Troisième article des antennes un peu plus long que le scape ***fumosus*** Gahan (p. 298)

— Troisiéme article des antennes un peu moins long que le scape ***saleyerianus*** Breuning (p. 298)

62. Sur chaque élytre une assez large bande transversale brune ou brun foncé, située juste après le milieu 63

— Elytres sane une bande pareille, ornés d'étroites bandes longitudinales blanches . 70

63. Bord latéral de l'élytre garni de poils dressés blancs 64

— Bord latéral de l'élytre garni de poils dressés noirs 66

64. Elytres peu finement ponctués . . . . ***subexiguus*** Breuning (p. 307)

— Elytres très finement ponctués 65

65. Les points des élytres sont subalignés sur la moitié latérale ***ivorensis*** Breuning (p. 315)

— Les points des élytres non subalignés sur la moitié latérale ***subfasciatipennis*** Breuning (p. 305)

66. L'épine latérale du pronotum faiblement recourbée . ***pseudexiguus*** Breuning (p. 307)

— L'épine latérale du pronotum fortement recourbée 67

67. Les points des élytres sont disposés sans ordre . ***senegalensis*** Breuning (p. 315)

— Les points des élytres sont subalignés 68

68. La bande transversale brune est large et transverse . . ***inclusus*** Pascoe (p. 308)

— La bande transversale brune est étroite et descend dans la moitié suturale obliquement en direction de la suture 69
69. Pronotum parsemé de taches minimes dénudées ***densefuscosticticus*** Breuning (p. 312)
— Pronotum sans taches semblables . . . ***obliquevittatus*** Breuning (p. 314.)
70. Pronotum orné de deux larges bandes longitudinales discales ochracées ***ochreovitticollis*** Breuning (p. 314)
— Pronotum sans ces bandes 71
71. L'épine latérale du pronotum précédée d'une bosse latérale obtuse ; sur chaque élytre douze bandes linéiformes blanches 72
— L'épine latérale non précédée d'une bosse latérale, les élytres ornés de bandes blanches moins nombreuses. 73
72. Elytres finement ponctués . . . . . ***multilineatus*** Breuning (p. 311)
— Elytres grossièrement ponctués . . . . . ***alternans*** Breuning (p. 308)
73. Chaque élytre avec dix très étroites bandes longitudinales blanches ***albolineatus*** Breuning (p. 310)
— Elytres avec moins de bandes blanches 74
74. Chaque élytre avec six bandes longitudinales blanches ***vittulatus*** Aurivillius (p. 311)
— Chaque élytre avec huit ou neuf bandes blanches 75
75. L'épine latérale du pronotum dirigée droit vers l'arrière ***albovittipennis*** Breuning (p. 309)
— L'épine latérale du pronotum dirigée obliquement vers l'arrière ***albovittatus*** Breuning (p. 309)

7. Sousgenre *OLIGOPSIS* Thomson

1. Elytres d'un vert métallique unicolore . . . ***viridipennis*** Breuning (p. 317)
— Elytres jamais vert métallique 2
2. Chaque élytre avec huit bandes longitudinales blanches sur la moitié antérieure ***sexseriatus*** Aurivilius (p. 316)
— Elytres sans ces bandes 3
3. Sur chaque élytre, dans la moitié antérieure, deux séries longitudinales de très petites taches jaune blanchâtre . . . . ***timorensis*** Breuning (p. 321)
– Elytres autrement dessinés 4
4. Sur chaque élytre de petites taches blanches, disposées en sept séries longitudinales . . . . ***seriatomaculatus*** Schwarzer (p. 322)
– Elytres autrement dessinés 5
5. Elytres ornés de nombreuses taches jaune pâle disposées sérialement et agglomérées en une bande transversale postmédiane ondulée 6
– Elytres autrement dessinés 8
6. Pubescence foncière des élytres brun foncé . . . ***roonwali*** Breuning (p. 321)
– Pubescence foncière des élytres brun rougeâtre 7
7. Lobes inférieurs des yeux deux fois plus longs que les joues ***exocentroides*** Thomson (p. 320)
— Lobes inférieurs des yeux un peu plus longs que les joues ***albizziae*** Fisher (p. 320)
8. Sur chaque élytre une bande transversale noire située un peu après le milieu . 9
– Elytres sans une bande pareille 11
9. En plus sur chaque élytre une grande tache basilaire discale brun foncé ***meridionalis*** Breuning (p. 316)
– Elytres parsemés de très petites taches brun foncé, mais sans cette tache basilaire brun foncé. 10
10. L'épine latérale du pronotum pointue . . . . ***longipilis*** Fairmaire (p. 319)
— L'épine latérale du pronotum trounquée à l'apex . . ***major*** Breuning (p. 317)
11. Sur chaque élytres quatre grandes taches circulaires noirâtres ***nigroplagiatus*** Breuning (p. 318)
— Elytres sans ces taches 12

12. Sur chaque élytre une assez grande tache postmédiane latérale brune . . . **betschuanus** Breuning (p. 316)
— Elytres sans cette tache 13
13. Elytres grossièrement ponctués . . . . . . **patrizii** Breuning (p. 318)
— Elytres finement ponctués 14
14. Elytres couverts de pubescence unicolore jaune grisâtre . . . **unicoloripennis** Breuning (p. 318)
— Elytres couverts de pubescence brun foncé et ornés, chacun, de deux bandes transversales floues gris blanchâtre, une postbasilaire et une médiane . . . **annamensis** Breuning (p. 321)

8. Sousgenre *FORMOSEXOCENTRUS* Breuning

Une seule espèce . . . . **variepennis** Schwarzer (p. 322)

9. Sousgenre *TUBERCULEXOCENTRUS* Breuning

Une seule espèce . . . . **basituberculatus** Pic (p. 323)

10. Sousgenre *DENTEXOCENTRUS* Breuning

Une seule espèce . . . . **dentipes** Breuning (p. 323)

1. *EXOCENTRUS* MULSANT SOUSGENRE *EXOCENTRUS* SENSU STRICTO

Exocentrus Mulsant, 1839, *Col. Fr., Long.* : 152.
Exocentrus Sousgenre *s. str.*, Lepesme & Breuning, 1955, *Bull. Soc. ent. Fr.* **60** : 127.

Troisième article des antennes aussi long que le quatrième. Elytres arrondis à l'apex, ponctués sans ordre.

Type : *lusitanus* Linné.

1. *Exocentrus lusitanus* Linné

Cerambyx lusitanus Linné, 1767, *Syst. Nat.*, ed. 12 : 1767.
Cerambyx subpilosus Piller & Mitterpiller, 1783, *Iter* : 67, pl. 8, fig. 5.
Cerambyx lusitanicus Olivier, 1790, *Encycl. méthod.*, *Ent.* **5** : 269 ; 1795, *Ent.* **4**, No. 67 : 120, No. 70, pl. 5, fig. 54.
Cerambyx pubicornis Schrank, 1790, *Naturf.* **24** : 76.
Cerambyx quercus Rossi, 1790, *Fna. Etrusca*, **1** : 143.
Cerambyx crinitus Panzer, 1795, *Ent. Germ.* : 249.
Lamia balteata Gyllenhal, 1817, Schönherr, *Syn. Ins.*, Append. **2** : 163.
Exocentrus balteus Schiödte, 1864, *Naturl. Tidskr.* (2) **3** : 561.
Exocentrus lusitanus Linné, Ganglbauer, 1883, *Wien. ent. Ztg.* **2** : 299, pl. 4, fig. 2 ; 1884, *Best. Tab.* **8** : 530.

Antennes un peu plus longues que le corps, le troisième article à peine aussi long que le scape. Lobes inférieurs des yeux sensiblement plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une mince épine latérale pointue fortement recourbée. Elytres très densément et très finement ponctués sur les trois quarts antérieurs.

Rouge, couvert d'une très fine pubescence jaunâtre. Sur chaque élytre une large bande transversale postmédiane brune qui n'atteint pas tout à fait la suture.

Long. : 4–5 mm. ; Larg. : 1 mm. 1/2–2 mm.

Décrit sur des individus de Lusitanie.—Répandu par l'Europe sauf l'Angleterre.

E. subpilosus Pill. & Mitterp., *lusitanicus* Ol., *pubicornis* Schr., *quercus* Rossi, *crinifer* Panz, *balteata* Gyll. et *balteus* Schiödte sont des synonymes.

2. ***Exocentrus adspersus*** Mulsant

Exocentrus adspersus Mulsant, 1846, *Col. Fr., Long.*, Suppl. : (9).
Exocentrus adspersus Mulsant, Fairmaire, 1864, *Gen. Col. d'Eur.* **4**, pl. 47, fig. 217.
Exocentrus adspersus Mulsant, Ganglbauer, 1884, *Best. Tab.* **8** : 529.

Antennes un peu plus longues que le corps, le troisième article à peine aussi long que le scape. Lobes inférieurs des yeux sensiblement plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale pointue faiblement recourbée. Elytres très densément et très finement ponctués sur les trois quarts antérieurs.

Rouge, couvert d'une très fine pubescence jaunâtre. Elytres parsemés de petites taches blanchâtres, disposées en séries longitudinales, plus nombreuses surtout au quart apical ; ces taches font défaut sur l'emplacement d'une assez large bande transversale postmédiane ondulée mais sont condensées souvent juste avant cette bande en forme d'une étroite bande transversale ondulée. Dessous du corps plutôt brun à fine pubescence blanchâtre. Partie basilaire des articles antennaires 3 et 4 à pubescence blanchâtre.

Long : 6–8 mm. ; Larg. : 2–2 mm. 1/2

Décrit sur des individus des environs de Lyon.—Europe centrale et méridionale ; Caucase, Transcaucasie (Plaviltschikov).

var. ***clarae*** Mulsant

Exocentrus clarae Mulsant, 1861, *Ann. Soc. Linn. Lyon* (2), **8** : 206.
Exocentrus adspersus var. *clarae* Pic, 1891, *Long.* **1** : 46 ; 1915, *Long.* **9** : 22.

Comme la forme typique, mais les petites taches blanchâtres des élytres interrompent en partie aussi la bande transversale postmédiane brune.

var. ***revelieri*** Mulsant & Rey

Exocentrus revelieri Mulsant & Ray, 1875, *Ann. Soc. Linn. Lyon* (2) **21** : 413.
Exocentrus adspersus var. *revelieri*, Pic, 1891, *Long.* **1** : 47.

Comme la forme typique, mais avec la coloration fondamentale des élytres d'un brun foncé.

3. ***Exocentrus stierlini*** Ganglbauer

Exocentrus stierlini Ganglbauer, 1883, *Wien. ent. Ztg.* **2** : 298, pl. 4, fig. 3 : 1884, *Best. Tab.* **8** : 530.

Antennes un peu plus longues que le corps, le troisième article à peine aussi long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum deux fois plus large que long, densément et extrêmement finement obliquement strié, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et très finement ponctués sur les trois quarts antérieurs.

Rouge, couvert d'une très fine pubescence jaunâtre. Sur chaque élytre une large bande transversale postmédiane brune largement arrondie du côté de la suture qu'elle n'atteint pas tout à fait, et une bande transversale préapicale brune très peu apparente ; chacun des points situées entre ces deux bandes entouré d'un très petit cercle brun.

Long. : 4–6 mm. ; Larg. ; 1 mm. 1/2–2 mm.

Décrit sur des individus d'Europe méridionale.—Allemagne, Autriche (Ganglbauer) ; Hongrie (Aurivillius) ; Sibérie (Plaviltschikov).

4. *Exocentrus punctipennis* Mulsant & Guillebeau

Exocentrus punctipennis Mulsant & Guillebeau, 1856, *Ann. Soc. Linn. Lyon* (2) **3** : 103.
Exocentrus punctipennis Mulsant & Guillebeau, Ganglbauer, 1884, *Best. Tab.* **8** : 530.

Antennes un peu plus longues que le corps, le troisième article à peine aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une large épine latérale pointue fortement recourbée. Elytres très densément et trés finement ponctués sur les trois quarts antérieurs.

Rouge, couvert d'une fine pubescence jaune paille. Disque du pronotum, rembruni sauf au bord antérieur et au bord postérieur. Elytres parsemés de très petites taches brunes rangées en séries longitudinales. Sur chaque elytre une large bande transversale ondulée brune qui n'atteint pas tout à fait la suture.

Long. : 4–6 mm. ; Larg. ; 1 mm. 1/2–2 mm. 1/4.

Décrit sur des individus de Lyon.—Répandu par l'Europe centrale et méridionale.

var. *signatus* Mulsant & Rey

Exocentrus signatus Mulsant & Ray, 1863, *Ann. Soc. Linn. Lyon* (2) **10** : 163.
Exocentrus punctipennis var. *signatus* Ganglbauer, 1884, *Best. Tab.* **8** : 530.
Exocentrus graecus Pic, 1901, *Echange*, **17** : 52.

Comme la forme typique, mais la bande transversale brune de l'élytre moins large et plus foncée.

Grêce et Turquie.

5. *Exocentrus galloisi* Matsushita

Exocentrus galloisi Matsushita, 1933, *Journ. Fac. Agric. Hokk.* **34** : 396, 397, pl. 4, fig. 7.

Proche de *punctipennis* Mulsant & Guillebeau, mais l'épine latérale du pronotum un peu moins fortement recourbée et les élytrés sans petites taches brunes disposées en séries longitudinales.

Décrit sur un individu du Japon : Chiuzenji au Musée de Hokkaido.—Ile Hondo (coll. Frey).

6. *Exocentrus savioi* Pic

Exocentrus curtipennis Pic var. *Savioi* Pic, 1925, *Bull. Soc. ent. Fr.* : 138.
Exocentrus curtipennis Pic var. *Savioi* Pic, Savio, 1929, *Not. d'Ent. chin.* : 1.
Exocentrus curtipennis Pic var. *Savioi* Pic, Gressitt, 1951, *Longicornia*, **2** : 527.

Proche de *punctipennis* Mulsant & Guillebeau, mais l'épine latérale du pronotum plus mince et plus longue et la bande transversale postmédiane brune de l'élytre plus fortement ondulée et devenant beaucoup moins large dans le tiers sutural.

Décrit sur un individu de Chine : Zikawei dans la coll. Pic.—Provinces de Kiangsi et Kiang-su (Gressitt) ; Chekiang (coll. Frey) ; Ile de Formose (Gressitt).

7. ***Exocentrus lineatus*** Bates

Exocentrus lineatus Bates, 1873, *Ann. Mag. nat. Hist.* (4) **12** : 384.
Exocentrus lineatus Bates, Matsushita, 1933, *Journ. Fac. Agric. Hokk.* **34** : 396.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale mince et pointue, dirigée obliquement vers l'arrière. Elytres très densément et finement ponctués sur les quatre cinquièmes antérieurs.

D'un rouge assez foncé, couvert d'une fine pubescence brun grise. Elytres revêtus de pubescence brun rougeâtre et ornés, chacun, dans la moitié antérieure de cinq étroites bandes longitudinales jaunes ou jaune grisâtre ainsi que de trois courtes bandes pareilles dans le quart apical. Moitié apicale des tibias et les tarses brun foncé. Antennes à pubescence brun rougeâtre foncé.

Long. : 5–6 mm. ; Larg. : 2–2 mm. 1/4.

Décrit sur des individus du Japon au Muséum de Paris.—Iles Hondo, Shikoku et Kiushiu (Matsushita).

8. ***Exocentrus testudineus*** Matsushita

Exocentrus testudineus Matsushita, 1931, *Trans. Sapp. Nat. Hist. Soc.* **12** : 47 ; 1933, *Journ. Fac. Agric. Hokk.* **34** : 396.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum faiblement transverse, pourvu d'une assez longue épine latérale pointue à peine recourbée. Elytres très densément et finement ponctués dans les trois quarts antérieurs, éparsément et très finement dans le quart apical.

Brun foncé couvert d'une très fine pubescence grise. Le bord antérieur et le bord postérieur du pronotum, les élytres et les antennes rouges et revêtus de pubescence brun rougeâtre. Ecusson à pubescence blanchâtre. Sur chaque élyte une grande tache circulaire préapicale suturale blanchâtre vague et deux bandes transversales de même couleur, une postbasilaire qui remonte obliquement en direction de l'épaule et une ondulée située juste après le milieu, ces deux bandes reliées ensemble par deux ou trois étroites bandes longitudinales discales de même couleur.

Long. : 6–8 mm. ; Larg. : 2 mm. 1/4–3 mm.

Décrit sur des individus du Japon : Ile Hokkaido, Mts. Daisetsu dans la coll. Matsushita.—Ile Hondo (Matsushita).

9. ***Exocentrus brevisetosus*** Gressitt

Exocentrus testudineus Matsushita subspecies *brevisetosus* Gressitt, 1938, *Philipp. Journ. Sc.* **64** : 167, pl. 1, fig. 4.
Exocentrus brevisetosus Gressitt, 1951, *Longicornia*, **2** : 526.

Proche de *testudineus* Matsushita, mais l'épine latérale du pronotum plus fortement recourbée, les élytres plus grossièrement ponctués et garnis de poils dressés plus courts.

Long. : 4 mm. ; Larg. ; 1 mm. 1/2.

Décrit sur un individu de l'Ile de Formose : Hori, à l'Académie de Californie.

Je ne connais cette espèce que d'après la description.

10. ***Exocentrus pici***, *nom. nov.*

Exocentrus signatus Pic, 1933, *Matér. Longic.* **11** : 6.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum transverse, pouvu d'une longue épine latérale mince et pointue, dirigée obliquement vers l'arrière. Elytres très densément et finement ponctués.

Brun foncé, couvert de pubescence brun rougeâtre foncé. Sur chaque élytre une très étroite bande suturale blanchâtre, une bande prémédiane blanche peu large qui remonte obliquement en direction de l'épaule et qui est interrompue dans sa moitié latérale par de petites taches dénudées, une assez étroite bande transversale postmédiane fortement zigzaguée et une étroite tache discale préapicale blanche. La partie de l'élytre entres les bandes prémédiane et postmédiane rouge à pubescence brun rougeâtre clair. Tibias rouge clair.

Long. : 6 mm. ; Larg. ; 2 mm. 1/2.

Décrit sur un individu de Chine : Province de Szetschouan, Tatsienlu, Dzaschi dans la coll. Frey, sous le nom *signatus*. Ce nom étant préoccupé je le change en *pici*.

11. ***Exocentrus badius*** Fisher

Exocentrus badius Fisher, 1925, *Philipp. Journ. Sc.* **28** : 242.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Pronotum fortement transverse, pourvu d'une assez longue et mince épine latérale pointue, dirigée obliquement vers l'arrière. Elytres densément et peu finement ponctués sur les trois quarts antérieurs.

Brun rougeâtre couvert d'une fine pubescence grise. Elytres revêtus de pubescence brun rougeâtre et parsemés de petites taches circulaires grises, ces taches faisant défaut sur l'emplacement d'une grande tache transversale postmédiane latérale.

Long. : 5 mm. ; Larg. : 2 mm.

Décrit sur un individu de l'Ile Mindanao : Davao, au Musée de Washington.

Je ne connais cette espèce que d'après la description.

12. ***Exocentrus albovarius*** Fisher

Exocentrus albovarius Fisher, 1925, *Philipp. Journ. Sc.* **28** : 243.

Proche de *badius* Fisher, mais le pronotum deux fois plus large que long, son épine latérale plus rapprochée de la base et dirigée vers l'arrière, le corps d'un brun plus foncé, la tache postmédiane de l'élytre dépourvue de taches grise est de forme plus irrégulière.

Long. : 3 mm. 1/2–5 mm. ; Larg. : 1 mm. 1/2–2 mm.

Décrit sur des individus de l'Ile Mindanao : Davao, au Musée de Washington.

Je ne connais cette espèce que d'après la description.

13. ***Exocentrus philippinus*** Fisher

Exocentrus philippinus Fisher, 1925, *Philipp. Journ. Sc.* **28** : 246.

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Pronotum de moitié plus large que long, pourvu d'une longue épine latérale pointue, dirigée obliquement vers l'arriére. Elytres densément et peu finement ponctués sur les trois quarts antérieurs.

Brun rougeâtre, couvert d'une fine pubescence blanchâtre. Tête à pubescence grise. Elytres revêtus de pubescence brune et marbrés de jaune pâle, ces marbrures condensées en une grande tache humérale, une bande transversale au tiers apical et en quelques petites taches au quart apical rangées en séries longitudinales. Dessous noirâtre. Antennes à pubescence grise.

Long. : 4 mm. 1/2–7 mm. ; Larg. : 1 mm. 3/4–2 mm. 1/2.

Décrit sur des individus de l'Ile Mindanao : Davao et Zamboanga, au Musée de Washington.

Je ne connais cette espèce que d'après la description.

14. ***Exocentrus echimys*** Pascoe

Exocentrus echimys Pascoe, 1864, *Trans. ent. Soc. Lond.* (3) **3** : 30.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois et demie plus longs que les joues. Pronotum deux fois plus large que long, éparsément et finement ponctué, pourvu d'une épine latérale pointue dirigée très obliquement vers l'arrière. Elytres densément et très finement ponctués.

Rouge, couvert d'une fine pubescence jaune pâle. Elytres avec une large bande transversale postmédiane rouge foncé floue. Tiers apical des tibias brun foncé.

Long. : 5 mm. ; Larg. : 1 mm. 2/3.

Décrit sur un individu de l'Ile Morty (Morotai), au British Muséum.

15. ***Exocentrus erinaceus*** Pascoe

Exocentrus erinaceus Pascoe, 1863, *Trans. ent. Soc. Lond.* (3) **1** : 529.

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum transverse, pourvu d'une épine latérale pointue très fortement recourbée. Elytres densément et assez grossièrement ponctués sur les trois quarts antérieurs.

Brun foncé. Elytres revêtus de pubescence brun rougeâtre foncê et marbrés un peu avant le milieu et sur le tiers apical de jaune paille. L'extrême base des articles antennaires à partir du quatrième à pubescence blanchâtre.

Long. : 4 mm. 1/2 ; Larg. : 1 mm. 1/3.

Décrit sur un individu de Queensland : Port Denison, au British Muséum.

16. ***Exocentrus lachrymosus*** Pascoe

Exocentrus lachrymosus Pascoe, 1864, *Trans. ent. Soc. Lond.* (3) **3** : 29.

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée et précédée d'une bosse latérale obtuse. Elytres densément et très finement ponctués.

Brun rougeâtre. Sur chaque élytre cinq rangées longitudinales de petites taches jaune blanchâtre.

Long. : 5 mm. 1/2 ; Larg. : 2 mm.

Décrit sur un individu de Borneo : Sarawak, au British Muséum.

17. ***Exocentrus insulicola*** *nom. nov.*

Exocentrus insularis Fisher, 1934, *Stylops*, **3** : 36, 42.

Antennes aussi longues que le corps, le troisième article un peu moins long que le scape. Pronotum transverse, pourvu d'une petite épine latérale pointue, dirigée obliquement vers l'arrière. Elytres assez densément et peu finement ponctués sur les trois quarts antérieurs.

Brun rougeâtre, couvert de pubescence jaunâtre. Pronotum avec deux taches obliques discales blanchâtres floues. Elytres revêtus de pubescence brune et ornés d'assez nombreuses taches oblongues blanches, condensées en une sorte de bande transversale médiane ondulee et faisaint défaut sur l'emplacement d'une large bande transversale postmédiane.

Long. : 4 mm. 1/2 ; Larg. : 1 mm. 1/2.

Décrit sur un individu de l'!le Banka : Mt. Mangkol, au Musée de Washington.

Je ne connais cette espèce que d'après la description.

18. ***Exocentrus bauhiniae*** Fisher

Exocentrus bauhiniae Fisher, 1934, *Stylops*, **3** : 36, 37.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale conique et pointue, dirigée obliquement vers l'arrière. Elytres densément et peu finement ponctués sur les trois quarts antérieurs.

Brun, couvert de pubescence jaune blanchâtre. Elytres revêtus de pubescence brun rougeâtre et ornés, chacun, d'une étroite bande longitudinale suturale et de cinq bandes longitudinales discale blanchâtres largement interrompues après le milieu. Antennes à pubescence brun jaunâtre, à pubescence un peu plus claire sur la partie basilaire des articles à partir du troisième.

Long. : 4–5 mm. 1/2 ; Larg. : 1 mm. 1/2–2 mm. 1/4.

Décrit sur un individu de Java : Kadiri, au Musée de Washington.—Samarang, Buitenzoorg, etc. (Fisher).

19. ***Exocentrus hageni*** sp. n.

Antennes aussi longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une épine latérale conique et pointue, dirigée vers l'arrière et précédée d'une bosse latérale obtuse. Elytres très densément et assez finement ponctués sur les quatre cinquièmes antérieurs.

Rouge, couvert d'une très éparse pubescence jaunâtre. Elytres parsemés de nombreuses petites taches jaune pâle, rangées, sur chacun, en forme de sept séries longitudinales.

Long. : 5 mm. 1/2 ; Larg. : 1 mm. 3/4.

Type de Sumatra : Serdang, Tandjong-Morawa, leg. D. B. Hagen, au Muséum de Leiden.

20. ***Exocentrus enganensis*** Breuning

Exocentrus (*s. s.*) *enganensis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 8.

Antennes à peine aussi longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une assez longue épine latérale pointue, dirigée obliquement vers l'arrière. Elytres très densément et finement ponctués sur toute leur étendue.

Rouge, couvert d'une fine pubescence soyeuse grise. Ecusson bordé en arrière de pubescence blanche. Elytres revêtus de pubescence brun rougeâtre et ornés de très petites taches blanches, rangées, sur chacun, en forme de sept séries longitudinales régulières ; ces taches plus nombreuses pour former aussi deux étroites bandes transversales, une prémédiane qui remonte obliquement en direction de la marge externe et une médiane qui descend un peu en direction de la marge externe. Partie basilaire des articles antennaires 4 et 5 à pubescence blanchâtre.

Long. : 5 mm. ; Larg. : 2 mm.

Décrit sur un individu de l'Ile Engano, au British Muséum.

21. ***Exocentrus sublineatus*** Breuning

Exocentrus (*s. s.*) *sublineatus* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 7.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale pointue fortement recourbée. Elytres densément et finement ponctués sur les trois quarts antérieurs.

Rouge, couvert de pubescence brun rougeâtre. Sur chaque élytre une étroite bande suturale, six étroites bandes longitudinales discales atteignant presque le milieu, trois bandes semblables parcourant le tiers apical et quelques très petites taches entre ces deux séries de bandes, toutes de couleur jaune pâle.

Long. : 4–5 mm. ; Larg. : 1 mm. 3/4–2 mm.

Décrit sur un individu de l'Indochine : Saigon à l'Institut Royal des Sciences Naturelles de Belgique.—Tonkin : Hoa–Binh (coll. Frey). Cette espèce se rapproche beaucoup de *lineatus* Bat., mais s'en distingue par l'épine latérale du pronotum moins étroite et plus fortement recourbée, les bandes claires de la moitié antérieure de l'élytre plus courtes, etc.

22. ***Exocentrus suturalis*** Pic

Exocentrus suturalis Pic, 1926, *Mél. exot. ent.* **45** : 28.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une longue épine latérale pointue, dirigée directement vers l'arrière et précédée d'une bosse latérale obtuse. Elytres densément et finement ponctués.

Rouge foncé, couvert de pubescence grisâtre. Elytres parsemés de nombreuses petites taches jaune pâle, rangées, sur chacun, en cinq séries longitudinales, et avec une étroite bande suturale jaune pâle.

Long. : 5 mm. ; Larg. ; 2 mm. 1/4.

Décrit sur un individu du Tonkin à la coll. Pic.

23. ***Exocentrus albomaculatus*** Pic

Exocentrus albomaculatus Pic, 1928, *Mél. exot. ent.* **51** : 29.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale pointue fortement recourbée. Elytres densément et finement ponctués sur les trois quarts antérieurs et garnis de très longs poils dressés.

Brun foncé, couvert de pubescence brune. Elytres rouges et parsemés de taches circulaires blanches. Antennes brun foncé.

Long. : 3 mm. ; Larg. : 3/4 mm.

Décrit sur un individu du Tonkin à la coll. Pic.

24. ***Exocentrus pseudandamanensis*** sp. n.

Exocentrus pseudandamanensis Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 8.
Exocentrus andamanensis Fisher part., 1932, *Stylops*, **1** : 231.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue fortement recourbée. Elytres assez densément et finement ponctués sur les trois quarts antérieurs.

Rouge, couvert d'une fine pubescence jaune grise. Elytres revêtus de pubescence brun rougeâtre et parsemés de nombreuses petites taches jaune blanche, rangées, sur chacun, en forme de sept séries longitudinales. Antennes à pubescence brun rougeâtre.

Long : 5 mm. ; Larg. : 2 mm.

Type de Birmanie : Katha, Mohngin Res., au British Muséum.

Fisher identifie cet exemplaire avec *andamanensis* Fisher tout en parlant de différences.

25. ***Exocentrus downingi*** Fisher

Exocentrus downingi Fisher, 1932, *Stylops*, **1** : 226.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une courte épine latérale peu pointue fortement recourbée. Elytres densément et extrêmement finement ponctués dans les deux tiers antérieurs.

Brun foncé, couvert de pubescence brune. Les bords des yeux et la base du pronotum à pubescence jaune pâle. Elytres marbrés de blanchâtre dans le quart basilaire et dans le tiers apical et avec quelques très petites taches blanchâtres entre ces deux zones. Partie basilaire des articles antennaires 4 à 9 à pubèscence blanchâtre.

Long. : 7 mm. ; Larg. : 2 mm. 1/2.

Décrit sur un individu de l'Inde : Nilghiri Hills, au British Muséum.

26. ***Exocentrus beesoni*** Fisher

Exocentrus beesoni Fisher, 1933, *Ind. For. Rec.* (4) **18** : 3.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux aussi longs que les joues. Pronotum deux fois plus large que long, pourvu d'une longue épine latérale conique et pointue fortement recourbée. Elytres densément et finement ponctués dans les trois quarts antérieurs.

Brun, couvert d'une fine pubescence gris clair. Ecusson à pubescence gris blanchâtre. Elytres et antennes revêtus de pubescence brun rougeâtre, les élytres parsemés de taches gris blanchâtre floues couvrant la majeure partie de la moitié antérieure et formant une bande transversale préapicale ondulée. Partie basilaire des articles antennaires 2 à 10 à pubescence blanchâtre.

Long. : 5–5 mm. 1/2 ; Larg. : 2–2 mm. 1/4.

Décrit sur des individus de l'Inde : Madras, N. Salem, Ayur, au British Muséum et au Musée de Washington.

27. ***Exocentrus transversifrons*** Fisher

Exocentrus transversifrons Fisher, 1940, *Ind. For. Rec.* (2) **6** : 209.

Antennes de moitié plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum transverse, pourvu d'une longue épine latérale mince et pointue faiblement recourbée. Elytres très densément et finement ponctués.

Brun couvert de pubescence jaune paille. Elytres densément marbrés de brun.

Long. : 6–7 mm. ; Larg. : 2–3 mm.

Décrit sur des individus de l'Inde : U.P. Chakrata Range, au British Muséum et au Musée de Dehra Dun.

28. ***Exocentrus tesselatus*** Perroud

Exocentrus tesselatus Perroud, 1855, *Ann. Soc. Linn. Lyon* (2) **2** : 397 ; *Mel. ex.* **3** : 77.

Antennes d'un quart plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres assez densément et extrêmement finement ponctués dans les deux tiers antérieurs.

Rouge, couvert de pubescence jaune paille. Tête, pronotum, écusson et scape à pubescence rousseâtre. Elytres marbrés, sauf dans la région apicale, de brun. Articles antennaires à partir du troisième rembrunis à l'apex.

Long. : 5 mm. ; Larg. : 1 mm. 2/3.

Décrit sur un individu de l'Inde : Pondichery, dans la coll. Pic.

29 ***Exocentrus parrotiae*** Fisher

Exocentrus parrotiae Fisher, 1932, *Ind. For. Rec.* **16** : 296, 304.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux aussi longs que les joues. Pronotum deux fois plus large que long, très éparsément et très finement granulé sur le disque, pourvu d'une épine latérale pointue fortement recourbée. Elytres très densément et finement ponctués.

Rouge, couvert d'une fine pubescence gris blanchâtre. Sur chaque élytre une tache discale postmédiane oblique brun rougeâtre. Articles antennaires à partir du troisième revêtus de pubescence brun rougeâtre, mais de pubescence blanchâtre sur la partie basilaire. Les poils dressés du dessus et des antennes sont noirs, ceux du bord lateral des élytres, du dessous et des pattes blancs.

Long. : 7–8 mm. 1/4 ; Larg. : 2 mm. 3/4–3 mm. 1/2.

Décrit sur des individus du Kashmir : Upper Munda, au British Muséum et au Musée de Dehra Dun.

30. ***Exocentrus klapperichi*** Breuning

Exocentrus (s. s.) *klapperichi* Breuning, 1957, *Ent. NachrBl. österr. u. schweiz. Ent.* **8**, No. 3 : 12.

Antennes d'un quart plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale pointue fortement recourbée. Elytres densément et très finement ponctués sur les trois quarts antérieurs.

Brun foncé, couvert de pubescence gris jaune. Pronotum rouge au bord antérieur et au bord postérieur, revêtu de pubescence brune. Sur chaque élytre deux bandes transversales zigzaguées brunes, une médiane qui s'élargit au bord latéral de facon à y occuper presque tous les deux tiers antérieurs, et une postmédiane qui n'atteint pas la suture, ainsi qu'une petite tache préapicale subsuturale brune. Moitié apicale des tibias et les antennes à pubescence brune.

Long. : 5–7 mm. ; Larg. : 1 mm. 3/4–2 mm. 1/4.

Décrit sur un individu d'Afghanistan : Nuristan, Kutiau, dans la coll. Tippmann. —Hindukusch : Chitral, Tal Bikir (Musée de Trieste).

31. ***Exocentrus kashmirensis*** Breuning

Exocentrus kashmirensis Breuning, 1957, *Ent. Arb. Mus. Frey*, **8** : 277.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux sensiblement plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une assez longue épine latérale mince et pointue, dirigée obliquement vers l'arrière. Elytres très densément et finement ponctués.

Rouge, couvert d'une pubescence jaunâtre. Chaque élytre avec sept séries longitudinales de petites taches jaune pâle qui s'arrêtent à peu près au milieu tout en y formant une bande transversale fortement ondulée, et, dans le tiers apical avec trois courtes bandes longitudinales discales, jaune pâle. Antennes à pubescence brun rougeâtre clair, la partie basilaire des articles 3 à 8 à pubescence jaunâtre.

Long. : 5 mm. ; Larg. : 1 mm. 3/4.

Type de Kaskmir : Kulu, 2300 m. alt., leg. C. Rost, dans la coll. Frey.—Un Paratype (*idem*).

32. ***Exocentrus madecassus*** Fairmaire

Exocentrus madecassus Fairmaire, 1880, *Ann. Soc. ent. Fr.* (5) **10** : 338.

Antennes un peu moins longues que le corps, le troisième article à peine aussi long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Tête et pronotum à ponctuation très fine et extrêmement dense. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale mince et pointue, faiblement recourbée. Elytres densément et peu finement ponctués sur les deux tiers antérieurs.

Rouge, le disque du pronotum sauf an bord antérieur et au bord postérieur, rembruni. Les côtés du pronotum et l'écusson couverts d'une fine pubescence gris clair. Elytres revêtus de pubescence brun rougeâtre clair et parsemés de petites taches gris blanchâtres serrées vagues qui font défaut sur l'emplacement d'une assez grande tache postmédiane suturale vague. L'extrême base des articles antennaires 3 à 11 à pubescence blanchâtre.

Long. : 5–6 mm. ; Larg. : 2 mm. 1/4–2 mm. 1/2.

Décrit sur des individus de Madagascar, au Muséum de Paris.—Suberbieville (Muséum de Paris).

33. ***Exocentrus interruptefasciatus*** Hunt & Breuning

Exocentrus interruptefasciatus Hunt & Breuning, 1957, *Durban Mus. Novit.* **5** : 64.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum transverse, pourvu d'une épine latérale pointue très fortement recourbée. Elytres densément et très finement ponctués sur toute leur étendue.

Rouge foncé, couvert de pubescence brun rougeâtre foncé. Ecusson et moitié antérieure des élytres revêtus presque entièrement de pubescence jaune blanchâtre. Moitié postérieure des élytres parsemée de petites taches jaune blanchâtre rangées en séries longitudinales et agglomérées le long de la suture. Moitié basilaire des tibias et les tarses, rouges. Le deuxième article des antennes et la partie basilaire des articles 3 à 11 rouge et couverts de fine pubescence jaune.

Long : 4–4 mm. 1/2 ; Larg. : 1 mm. 1/2–1 mm. 2/3.

Décrit sur des individus de Zululand : Ubombo, Eteza (coll. Hunt).

34. ***Exocentrus lacteolus*** Distant

Exocentrus lacteolus Distant, 1906, *Ins. Transvaal* : 166, fig. 26.

Antennes aussi longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale pointue, peu rapprochée de la base et assez faiblement recourbée. Elytres finement et extrêmement densément ponctués.

Rouge foncé. Elytres parsemés de très petites taches blanches disposées, sur chacun, en à peu près sept rangées longitudinales. Pattes rouge foncé. L'extrême base des articles antennaires 3 à 9 à pubescence blanche.

Long. : 4 mm. 1/2 ; Large. : 2 mm. 1/4.

Décrit sur des individus de Natal ; Durban au Musée de Pretoria.—Rhodesia : Salisbury (British Muséum).

35. ***Exocentrus ruficollis*** Lameere

Exocentrus ruficollis Lameere, 1892, *Ann. Soc. ent. belg.* **37** : 508.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une épine latérale pointue peu fortement recourbée. Elytres finement et extrêmement densément ponctués.

Noir, couvert de pubescence brun foncé. Pronotum, écusson et épipleures rouges et couverts de pubescence rousseâtre. Tout le quart apical le l'élytre couvert d'une fine et éparse pubescence gris jaunâtre. Sur chaque élytre une étroite bande transversale très ondulée gris clair située un peu avant le milieu. L'extrême base des articles antennaires à partir du quatrième à pubescence blanchâtre.

Long. : 5–7 mm. ; Larg. : 1 mm. 3/4–2 mm. 1/4

Décrit sur un individu du Congo à l'Institut Royal des Sciences Naturelles de Belgique.—Zambezi : Noca Choupanga près Chemba (Muséum de Paris) ; Afrique orientale anglaise : Xinavane (British Muséum).

36. ***Exocentrus subruficollis*** Breuning

Exocentrus (*s. s.*) *subruficollis* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 129.

Proche de *ruficollis* Lameere, mais l'épine latérale du pronotum sensiblement plus fortement recourbée et précédée d'une bosse latérale obtuse peu accusée et les élytres revêtus d'une pubescence unicolore brun foncé.

Décrit sur des individus du Congo belge : Mayidi, au Musée de Tervueren.— Répandu du Togo (Muséum de Paris), au Victoria Nyanza (Musée de Tervueren) et au Gabon (Muséum de Paris).

37. ***Exocentrus pseudoruficollis*** Breuning

Exocentrus (*s. s.*) *pseudoruficollis* Breuning, 1957, *Bull. Inst. roy. Sci. nat. Belg.* **33**, No. 8 : 8.

Proche de *ruficollis* Lameere, mais plus petit, l'épine latérale du pronotum plus courte et très fortement recourbée, précédée d'une bosse latérale obtuse peu accusée, les élytres très finement ponctués et entièrement d'un brun rouge clair, de même que le dessous du corps, les pattes et les antennes.

Long. : 4–6 mm. ; Larg. : 1 mm. 1/2–2 mm.

Décrit sur des individus du Cap, au British Muséum.

38. ***Exocentrus trinigrovittatus*** Breuning

Exocentrus (*s. s.*) *trinigrovittatus* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 7.

Antennes d'un quart plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une assez courte épine latérale pointue fortement recourbée. Elytres très densément et finement ponctués.

Noir. Téte et pronotum marbrés de blanchâtre et de brun noir. Ecusson et élytres revêtus de pubescence blanchâtre. Elytres parsemés de taches dénudées minimes et ornés, chacun, de trois bandes transversales noires, une étroite basilaire s'élargissant en direction de la suture, une assez large postmédiane faiblement ondulée et une apicale peu large. Tarses et antennes à pubescence noire, le deuxième article des antennes et la partie basilaire des articles 3 à 10 à pubescence blanche.

Long. : 5 mm. ; Larg. : 2 mm. 1/4.

Décrit sur un individu du Tanganyika : Shinyanga, au British Muséum.

39. ***Exocentrus asmarensis*** sp. n.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une assez longue épine latérale pointue fortement recourbée. Elytres densément et très finement ponctués.

Rouge, couvert de pubescence jaune paille. Elytres ornés d'une bande transversale postmédiane brun rougeâtre formant sur les deux élytres un grand *M*. Moitié apicale des tibias et les derniers articles antennaires d'un brun assez foncé.

Long. : 5 mm. 1/2 ; Larg. : 2 mm.

Type d'Erithrée : Asmara, dans la coll. Frey.

40. ***Exocentrus ugandicola*** Breuning

Exocentrus (*s. s.*) *ugandicola* Breuning, 1958, *Bull. Inst. roy. Sc. nat. Belg.*, **34**, No. 22.

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une assez longue épine latérale pointue et recourbée. Elytres densément et très finement ponctués sur les trois quarts antérieurs.

Brun noir, couvert de pubescence jaune pâle. Vertex et disque du pronotum, sauf une assez large bande longitudinale prothoracique dénudée, revêtus de pubescence jaune. Elytres parsemés de très petites taches circulaires brun noir et ornés, chacun, d'une large bande transversale postmédiane brun foncé s'amincissant beaucoup dans le tiers sutural, et de deux taches brun foncé : une discale proche de la suture et une latérale, préapicales. Moitié apicale des tibias, les tarses et les antennes à partir du troisième article à pubescence brun noir, le quart basilaire des articles antennaires 3 à 11 à pubescence blanchâtre.

Long. : 5–6 mm. ; Larg. : 2 mm. 1/4–2 mm. 1/2.

Décrit sur des individus de l'Uganda : Mpanga, au British Muséum.

41. ***Exocentrus ochreopunctatus*** Breuning

Exocentrus (*s. s.*) *ochreopunctatus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 129.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale pointue, dirigée obliquement vers l'arrière. Elytres très densément et très finement ponctués.

Noir, couvert de pubescence noire ; le bord antérieur et le bord postérieur du pronotum rougeâtres. Elytres vaguement marbrés de gris blanchâtre et ornés de très petites taches circulaires nettes ochracées, rangées en forme de deux étroites bandes transversales ondulées, une postbasilaire et une postmédiane. Partie basilaire des articles antennaires 3 à 11 à pubescence blanchâtre.

Long. : 7 mm. 1/2 ; Larg. : 2 mm. 1/2.

Décrit sur des individus de Ruanda : Gabiro, au Musée de Tervueren.

42. ***Exocentrus josephi*** Duvivier

Exocentrus josephi Duvivier, 1890, *Ann. Soc. ent. belg.* **34** : 38 ; *Bull. Soc. ent. Belg.* **1890** : 197.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale mince et assez longue, dirigée vers l'arrière et précédée d'une bosse latérale obtuse. Elytres densément et très finement ponctués.

Rouge, couvert de pubescence gris tirant sur le rougeâtre. Sur chaque élytre une étroite bande transversale postmédiane blanche faiblement ondulée. Partie basilaire des articles antennaires à partir du troisième à pubescence blanchâtre.

Long. : 4 mm. 2/3 ; Larg. : 2 mm.

Décrit sur un individu du Congo belge : Leopoldville, à l'Institut Royal des Sciences Naturelles de Belgique.

43. ***Exocentrus grisescens*** Jordan

Exocentrus grisescens Jordan, 1894, *Novit. Zool.* **1** : 246.
Exocentrus ortmansi Gahan, 1917, *Bull. Ent. Research*, **8** : 117.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres très densément et très finement ponctués.

Brun foncé, couvert de pubescence brun foncé vaguement entremélée de gris clair sur le disque des élytres. Elytres parsemés de très petites taches dénudées, disposées en séries longitudinales. Articles antennaires à partir du troisième revêtus de pubescence gris blanchâtre.

Long. : 6 mm. 1/2–7 mm. ; Larg. : 2 mm. 1/3–2 mm. 2/3.

Décrit sur un individu de Gabon : Kuilu, au Muséum de Paris.—Mayumbe (Gahan). *Exocentrus ortmansi* Gah. est un synonyme.

44. ***Exocentrus decellei*** Breuning

Exocentrus (*s. s.*) *decellei* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 127.

Antennes d'un quart plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale pointue, fortement recourbée. Elytres densément et très finement ponctués.

Brun foncé, couvert de pubescence soyeuse jaunâtre. Elytres revêtus de pubescence brun foncé et parsemés de petites taches de pubescence soyeuse jaunâtre, ces taches plus nombreuses le long de la suture et en forme de trois larges bandes transversales ondulées, une postbasilaire, une médiane et une postmédiane. Moitié apicale des tibias, les tarses et les antennes revêtus de pubescence brun foncé, les deux premiers articles des antennes et la base des articles 3 et 4 à pubescence soyeuse jaunâtre.

Long. : 4 mm. 1/2–5 mm. 1/2 ; Larg. : 2–2 mm. 1/2.

Décrit sur des individus du Congo belge : Yangambi, au Musée de Tervueren.

45. ***Exocentrus massarti*** Breuning

Exocentrus (*s. s.*) *massarti* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 127.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois et demie plus longs que les joues. Pronotum fortement transverse, pourvu d'une assez longue épine latérale pointue, fortement recourbée. Elytres très densément de très finement ponctués.

Brun foncé, couvert de pubescence brun foncé. Ecusson revêtu de pubescence jaunâtre. Sur chaque élytre trois larges bandes transversales ondulées, une postbasilaire, une médiane et une postmédiane, et une tache apico-suturale formées par l'agglomération de nombreuses petites taches jaunâtres.

Long. : 4 mm. 1/2 ; Larg. : 2 mm.

Décrit sur des individus du Congo belge : Lualaba, Kaniama, au Musée de Tervueren.

46. ***Exocentrus fuscosignatus*** Breuning

Exocentrus (*s. s.*) *fuscosignatus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 128.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux sensiblement plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale conique et pointue, dirigée obliquement vers l'arrière et précédée d'une bosse latérale proéminente, mais obtuse. Elytres densément et très finement ponctués.

Brun foncé, couvert de pubescence brune. Elytres revêtus de pubescence jaune pâle à l'exception d'une large bande transversale postmédiane brun foncé qui n'atteint pas tout à fait la suture et de deux assez grandes taches brun foncé, une basilaire située à côté de l'écusson et une latéro-prémédiane. Tiers basilaire des articles antennaires 3 à 6 couvert de pubescence gris blanchâtre.

Long. : 4 mm. 1/2 ; Larg. : 2 mm.

Décrit sur des individus du Congo belge : Mayidi, au Musée de Tervueren.

47. ***Exocentrus plagiatus*** Hintz

Exocentrus plagiatus Hintz, 1919, *Ergebn. d. II. Centr. Afr. Exped.* **1** : 630.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux plus de deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et très finement ponctués sur les deux tiers antérieurs.

Rouge, couvert de pubescence jaune paille. Elytres revêtus de pubescence brun rougeâtre, ornés de nombreuses taches jaune blanchâtre disposées en séries longitudinales et couvrant presque entièrement la moitié latérale, parsemés de taches minimes dénudées disposées également en séries longitudinales et pourvus, chacun, d'une assez grande tache discale postmédiane brun rougeâtre foncé en ovale allongé. Articles antennaires à partir du quatrième revêtus de pubescence brun rougeâtre, leur partie basilaire à pubescence jaune paille.

Long.: 6–8 mm. ; Larg. : 2 mm. 1/4–3 mm.

Décrit sur un individu du Congo belge : Sankuru, à l'Institut Royal des Sciences Naturelles de Belgique.—Mayidi (Musée de Tervueren) ; Lac Upemba région (Parcs Nationaux).

48. ***Exocentrus subplagiatus*** Breuning

Exocentrus (*s. s.*) *subplagiatus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 128.

Proche de *plagiatus* Hintz, mais plus petit, l'épine latérale du pronotum dirigée plus fortement vers l'arrière, la tache postmédiane foncée de l'élytre précédée de pubescence blanchâtre et les articles antennaires 4 à 11 sans pubescence jaune paille sur la partie basilaire.

Long. : 4 mm. ; Larg. : 1 mm. 1/2.

Décrit sur un individu du Congo belge : Moto, au Musée de Tervueren.

49. ***Exocentrus bialbomarmoratus*** Breuning

Exocentrus (*s. s.*) *bialbomarmoratus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 129.

Antennes aussi longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux sensiblement plus longs que les joues. Pronotum transverse, pourvu d'une petite et mince épine latérale pointue, dirigée obliquement vers l'arrière, précédée d'une bosse latérale obtuse. Elytres densément et très finement ponctués sur les deux tiers antérieurs.

Noir, couvert de pubescence noire. Ecusson à pubescence blanche. Les élytres présentent des marbrures blanchâtres dans la moitié antérieure et sur une bande transversale préapicale.

Long. : 3 mm. 1/2 ; Larg. : 1 mm. 1/4.

Décrit sur un individu du Congo belge : Tshela, au Musée de Tervueren.

50. ***Exocentrus albosticticus*** Breuning

Exocentrus (*s. s.*) *albosticticus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 128.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum transverse, pourvu d'une assez longue et mince épine latérale faiblement recourbée. Elytres très densément et assez finement ponctués.

Brun noir, couvert de pubescence brun foncé. Pronotum rouge. Elytres ornés de très petites taches blanchâtres, disposées de façon à former deux bandes transversales ondulées, un prémédiane et une postmédiane. Partie basilaire des articles antennaires 3 à 11 à pubescence blanche.

Long. : 5 mm. ; Larg. : 2 mm.

Décrit sur un individu du Congo belge : Elisabethville, au Musée de Tervueren.

51. ***Exocentrus hallei*** Lepesme & Breuning

Exocentrus (*s. s.*) *hallei* Lepesme & Breuning, 1955, *Bull. Soc. ent. Fr.* **60** : 128.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue, dirigée fortement vers l'arrière. Elytres densément et très finement ponctués.

Brun foncé, couvert de pubescence brun grisâtre. Sur chaque élytre sept séries longitudinales de petites taches blanchâtres. Elytres ornés en plus d'une étroite bande transversale médiane brune en forme de *M*. Antennes à pubescence brune, le deuxième article et la partie basilaire des articles 3 à 11 à pubescence blanchâtre.

Long. : 5 mm. 1/2 ; Larg. : 2 mm.

Décrit sur un individu de Côte d'Ivoire : Adiopodoumé, dans la coll. Lepesme.

52. ***Exocentrus m-fuscus*** Breuning

Exocentrus (*s. s.*) *m-fuscus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 126.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue, dirigée vers l'arrière. Elytres densément et très finement ponctués.

Brun foncé, couvert de pubescence jaune paille. Sur chaque élytre trois assez petites taches brun foncée : une latéro-posthumérale, une latéro-préapicale et une disco-préapicale ainsi qu'une étroite bande transversale médiane brun foncé formant avec celle de l'élytre opposé un grand *M* ; cette bande, ainsi que la tache disco-préapicale sont bordées en avant de pubescence blanche. Tiers apical des tibias et les tarses brun foncé. Les trois quarts apicaux des articles antennaires 3 à 11 à pubescence brun foncé.

Long. : 8 mm. 1/2 ; Larg. : 3 mm. 1/2.

Décrit sur un individu du Congo belge : Tohouapa, Boende, au Musée de Tervueren.

53. ***Exocentrus ziczac*** Breuning

Exocentrus (*s. s.*) *ziczac* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 6, fig. 5.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et très finement ponctués sur les deux tiers antérieurs.

Rouge foncé, couvert de pubescence brune entremélée de jaunâtre. Sur chaque élytre trois bandes transversales zigzaguées blanches, une postbasilaire très peu apparente, une postmédiane assez large descendant en oblique en direction de la suture et une préapicale. Quart basilaire des articles antennaires à partir du quatrième revêtu de pubescence blanche.

Long. : 6 mm. 1/2 ; Larg. : 3 mm.

Décrit sur un individu du Cameroun : Ja River, à l'Institut Royal des Sciences Naturelles de Belgique.

54. ***Exocentrus freyi*** Breuning

Exocentrus (*s. s.*) *freyi* Breuning, 1955, *Ent. Arb. Mus. Frey*, **1** : 665.

Antennes d'un tiers plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux plus de deux fois plus longs que les joues. Pronotum transverse, très éparsément et très finement ponctué, pourvu d'une très petite épine latérale pointue fortement recourbée. Elytres, sauf dans la partie apicale, densément et très finement ponctués.

Brun foncé couvert de pubescence jaune paille. Sur chaque élytre une bande transversale zigzaguée blanche, peu large située juste après le milieu. Le tiers basilaire des articles antennaires à partir du troisième à pubescence blanche, les deux tiers apicaux de ces articles à pubescence brun foncé.

Long. : 8–10 mm. ; Larg. : 3–3 mm. 3/4.

Décrit sur un individu de Guinée francaise : N'Zérékoré, dans la coll. Frey.—Dahomey (coll. Lepesme).

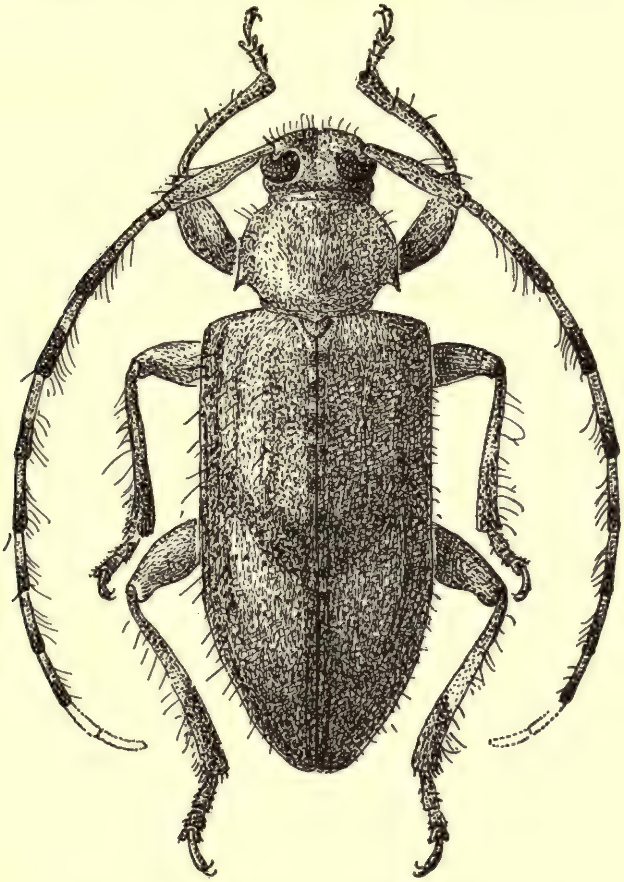

FIG. 1. *Exocentrus occidentalis* Breuning.

55. ***Exocentrus occidentalis*** Breuning

Exocentrus (*s. s.*) *occidentalis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 6.

Antennes d'un quart plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum fortement transverse, rétréci vers la base et pourvu d'une épine latérale pointue fortement recourbée. Elytres très densément et finement ponctués.

Rouge, couvert d'une fine pubescence jaune paille. Elytres parsemés de très petites taches circulaires brun foncé et ornés, chacun, d'une grande tache discale circulaire postmédiane brun foncé assez vague. Moitié apicale des tibias, les tarses et les antennes brun noir, le deuxième article des antennes, le tiers basilaire des articles 3 et 4 et le quart basilaire des articles 5 à 7, rouges.

Long. : 6 mm. 1/2 ; Larg. : 2 mm. 1/2.

Décrit sur un individu de Sénégal : Thiés, à l'Institut Royal des Sciences Naturelles de Belgique.

2. *EXOCENTRUS* SOUSGENRE *CAMPTOMYME* PASCOE

Camptomyme Pascoe, 1864, *Trans. ent. Soc. Lond.* (3) **3** : 27, 43.
Camptomyme Pascoe, Lacordaire, 1872, *Gen. Col.* **9** : 801, 815.
Exocentrus Sousgenre *Striatoexocentrus* Breuning, 1955, *Ann. Mus. civ. Stor. Nat. Genova*, **68** : 42.
Exocentrus Sousgenre *Camptomyme* Lepesme & Breuning, 1955, *Bull. Soc. ent. Fr.* **60** : 127.

Troisième articles des antennes aussi long que le quatrième. Les points sur les élytres rangés, tout au moins en majeure partie, en séries longitudinales. Elytres arrondis à l'ape.

Type *callioides* Pascoe.

56. *Exocentrus rufotibialis* Breuning

Exocentrus rufotibialis Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 10.

Antennes un peu plus longues que le corps, troisième article un peu moins long que le scape. Lobes inférieurs des yeux à peine deux fois plus longs que les joues. Pronotum très transverse, pourvu d'une épine latérale pointue, fortement recourbée. Tête et pronotum très densément et extrêmement finement ponctués. Elytres très densément et grossièrement ponctués, ces points non sérialement disposés sur le quart sutural.

Rouge foncé ; l'épaule, la moitié basilaire des articles antennaires trois et quatre, rouge clair. Le dessus couvert d'une fine pubescence blanchâtre. Elytres parsemés de très petites taches serrés dénudées. Sur chaque élytre une assez étroite bande transversale ondulée brune, peu apparente. Pattes rouge foncé. La moitié basilaire des articles antennaires trois et quatre et la base des articles suivants à pubescence blanche.

Long.: 8 mm.; Larg.: 3 mm.

Type du Sénégal, ex coll. Laferté, au British Muséum.

57. *Exocentrus guineensis* Breuning

Exocentrus (*Camptomyme*) *guineensis* Breuning, 1955, *Ent. Arb. Mus. Frey*, **6** : 666.

Antennes un peu plus longues que le corps, comparativement fines, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum transverse, pourvu d'une assez longue épine latérale pointue, très fortement recourbée, dirigée directement vers l'arrière. Elytres densément et très finement ponctués dans la moitié antérieure, les points sérialement disposés.

Rouge foncé, couvert de pubescence brune, entremélée de jaune pâle. Ecusson à pubescence blanchâtre. Elytres couverts de pubescence jaune pâle et ornés, chacun, d'une large bande longitudinale latérale d'un brun assez foncé, parcourant la moitié antérieure et reliée à une large bande transversale postmédiane fortement sinuée, de même couleur, qui n'atteint pas la suture. Antennes à pubescence brune. L'extrême base des articles à partir du troisième, à pubescence blanche.

Long.: 5 mm.; Larg.: 1 mm. 3/4.

Décrit sur un individu de Guinée francaise : N'Zérékoré dans la coll. Frey.

58. ***Exocentrus univittatus*** Breuning

Exocentrus (*Camptomyme*) *univittatus* Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32**, No. 25 : 15, fig. 8.

Antennes un peu plus longues que le corps, assez fortes, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum deux fois plus large que long, très éparsément et peu finement ponctué, pourvu d'une petite épine latérale pointue faiblement recourbée. Elytres densément et très finement ponctués, les points subalignés.

Rouge, couvert de pubescence jaune paille. Sur chaque élytre une bande transversale postmédiane blanche, qui remonte obliquement de la suture en direction de la marge externe. Moitié basilaire des articles antennaires à partir du troisième, à pubescence jaune pâle.

Long.: 9 mm.; Larg.: 3 mm. 1/2.

Décrit sur un individu de Gold Coast : Kumassi (Newbery), à l'Institut Royal des Sciences Naturelles de Belgique.

59. ***Exocentrus chevaugeoni*** Lepesme & Breuning

Exocentrus (*Camptomyme*) *chevaugeoni* Lepesme & Breuning, 1955, *Bull. Soc. ent. Fr.* **60** : 127.

Antennes un peu plus longues que le corps, épaisses, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale mince, dirigée obliquement vers l'arrière. Elytres très finement ponctués sur les deux tiers antérieurs.

Brun foncé. Chaque élytre avec deux bandes transversales blanchâtres floues, une postbasilaire et une postmédiane, cette dernière descendant obliquement en direction de la marge externe.

Long.: 3 mm. 1/2 à 4 mm.; Larg.: 1 mm. 1/3–1 mm. 1/2.

Décrit sur des individus de Côte d'Ivoire : Adiopodoumé, de la coll. Lepesme.

60. ***Exocentrus maiae*** Lepesme & Breuning

Exocentrus (*Camptomyme*) *maiae* Lepesme & Breuning, 1955, *Bull. Soc. ent. Fr.* **60** : 128.

Antennes aussi longues que le corps, épaisses, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale conique, légèrement dirigée vers l'arrière. Elytres densément et très finement ponctués, les points de la moitié latérale séparés par des intervalles très faiblement convexes.

Brun foncé luisant. L'extrême base du troisième article des antennes et le quart basilaire du quatrième article revêtus de pubescence blanche.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/2.

Décrit sur un individu de Côte d'Ivoire : Adiopodoumé, de la coll. Lepesme.

61. *Exocentrus latefasciatipennis* Breuning

Exocentrus (*Camptomyme*) *latefasciatipennis* Breuning, 1958, *Bull. Inst. roy. Sc. Nat.* **34**, No. 22.

Antennes un peu plus longues que le corps, le troisième article aussi long que le le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une épine latérale fortement recourbée. Elytres peu densément et finement ponctués sur les deux tiers antérieurs, les points sérialement disposés.

Brun foncé, couvert de pubescence brun rougeâtre foncé. Bord antérieur et bord postérieur du pronotum, rouges. Sur chaque élytre deux larges bandes transversales blanchâtres, une postbasilaire et une post médiane. Quart basilaire des tibias, le deuxième article des antennes et la partie basilaire des articles 3 à 9 rouge clair et revêtus d'une fine pubescence blanchâtre.

Long.: 4 mm.; Larg.: 1 mm. 1/2.

Décrit sur un individu de Côte d'Ivoire : Bouaké, à l'Institut Royal des Sciences Naturelles de Belgique.

62. *Exocentrus fernandopoanus* Baguena & Breuning sp.n.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum très transverse, très densément et extrêmement finement ponctué, pourvu d'une épine latérale pointue dirigée obliquement vers l'arrière. Elytres densément et finement ponctués dans la moitié antérieure.

Brun noir luisant. Pattes et antennes rouges. Sur chaque élytre deux étroites bandes transversales blanches, une postbasilaire courbée vers l'arrière dans le quart sutural et une médiane courbée vers l'avant dans le quart sutural, les deux se joignant en courbe régulière près de la suture.

Long.: 2 mm. 1/4 ; Larg.: 3/4 mm.

Décrit sur un individu de l'Ile Fernando Poo (leg. Baguena), au Musée de Madrid.

Cette espèce m'a été aimablement communiqué par Monsieur Baguena-Corella, lequel a collaboré à la description ; je tiens à lui exprimer ici mes vifs remerciements.

63. *Exocentrus minimus* Breuning

Exocentrus (*Camptomyme*) *minimus* Breuning, 1956, *Mitt. Münch. ent. Ges.* **46** : 83.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux de moitié plus que les joues. Pronotum transverse, fortement rétréci vers la base, pourvu d'une mince épine latérale pointue, dirigée obliquement vers l'arrière. Elytres densément et très finement ponctués.

Rouge clair. Chaque élytre avec deux bandes transversales blanchâtres ondulées et très peu apparentes, une prémédiane et une post médiane.

Long.: 2 mm.; Larg. 1 m.

Décrit sur un individu de Nigéria : Lagos, au Musée de Munique.

64. ***Exocentrus decorsei*** sp. n.

Antennes assez fines, un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longues que les joues. Pronotum très transverse, pourvu d'une petite épine latérale pointue, pas très fortement recourbée. Elytres densément et finement ponctués, les points rangées en séries longitudinales assez régulières.

Rouge, couvert d'une fine pubescence grise à reflets soyeux, cette pubescence condensée sur chaque élytre à plusieures bandes transversales ondulées assez floues, dont deux sont situées dans la moitié apicale, l'une juste après l'autre. Antennes brun foncé.

Long.: 3 mm.; Larg.: 1 mm.

Type de la Boucle di Niger : Douentra (Dounzou) au nord du 14° de lat., 1907, leg. Dr. Decorse, au Muséum de Paris.—Un Paratype (*idem*).

65. ***Exocentrus subarmatus*** Baguena & Breuning sp. n.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux plus de deux fois plus longs que les joues. Pronotum très transverse, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et peu finement ponctués dans les trois quarts antérieurs, les points rangés en séries longitudinales régulières. Fémurs très épais.

D'un brun noir luisant.

Long.: 2 mm. 2/3 ; Larg.: 1 mm.

Décrit sur un individu de l'Ile Fernando Poo (leg. Baguena), au Musée de Madrid.

Cette espèce m'a été aimablement communiqué par Monsieur Baguena-Corella.

66. ***Exocentrus armatus*** Hintz

Exocentrus armatus Hintz, 1919, *Ergebn. d. II. Centr. Afr. Exped.* **1** : 630.

Antennes un peu moins longues que le corps, épaisses, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum transverse, pourvu d'une épine latérale fortement recourbée et d'une bosse latérale obtuse située avant cette épine. Elytres densément et finement ponctués sur les trois quarts antérieurs, les points disposés en séries longitudinales régutués sur les trois quarts antérieurs, les points disposés en séries longitudinales régulières.

Brun foncé, couvert d'une fine pubescence brun foncé. Dessous du corps et pattes rouge foncé.

Long.: 4 mm.; Larg.: 1 mm. 1/2.

Décrit sur un individu du Cameroun, à l'Institut Royal des Sciences Naturelles de Belgique. Cameroun : N'Kongsamba (coll. Ardoin).

67. ***Exocentrus femoralis*** Hintz

Exocentrus femoralis Hintz, 1919, *Ergebn. d. II. Centr. Afr. Exped.* **1** : 630.

Antennes assez épaisses, aussi longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum transverse, pourvu d'une épine latérale pointue, fortement recourbée, très convexe à son bord antérieur. Elytres densement et très finement ponctués dans les trois quarts antérieurs, les points irrégulièrement disposés dans le tiers sutural, disposés en séries longitudinales peu régulières sur les deux tiers latéraux, les épaules finement granulés. Fémurs très claviformes.

Brun foncé ; le dessous du corps, les hanches et la base des fémurs, rouge clair, couvert d'une très fine pubescence blanchâtre. L'écusson à pubescence blanchâtre plus dense.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/3.

Décrit sur un individu du Cameroun : Douala, à l'Institut Royal des Sciences Naturelles de Belgique.—Congo belge : Yangambi (Mayné).

68. ***Exocentrus nitens*** Jordan.

Exocentrus nitens Jordan, 1903, *Novit. Zool.* **10** : 189.

Antennes aussi longues que le corps, assez fortes, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum très transverse, fortement rétréci vers la base, pourvu d'une petite épine latérale pointue modérément recourbée et d'une bosse obtuse tres faiblement accusée, située avant cette épine. Elytres très finement granulés sur la partie basilaire, ensuite densément et extrêmement finement ponctués jusqu'au milieu, les points assez régulièrement alignés.

Brun rougeâtre foncé luisant. Front, sterna, pattes et trois premiers articles antennaires rouge clair. Ecusson à pubescence blanchâtre. Sur chaque élytre deux étroites bandes transversales blanches peu régulières, une basilaire et une postbasilaire légèrement incurvée vers l'arrière à la suture, toutes deux formés de très petites taches.

Long.: 3 mm.; Larg.: 3/4 mm.

Décrit sur un individu du Cameroun : Lolodorf, au Muséum de Paris.

69. ***Exocentrus subnitens*** sp. n.

Antennes un peu plus longues que le corps, assez fortes, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum deux fois plus large que long, fortement rétréci vers la base, pourvu d'une petite épine latérale dirigée presque directement vers l'arrière. Elytres densément et peu finement ponctués sur les deux tiers antérieurs, les points assez régulièrement alignés.

Noir luisant.

Long.: 3 mm.; Larg.: 3/4 mm.

Type du Cameroun, leg. Conradt, à l'Institut Royal des Sciences Naturelles de Belgique.

70. ***Exocentrus strigosus*** Jordan

Exocentrus strigosus Jordan, 1903, *Novit. Zool.* **10** : 189.
Exocentrus maculatus Hintz, 1919, *Ergebn. d. II. Centr. Afr. Exped.* **1** : 631.
Exocentrus marmoratus Hintz, 1919, *Ergebn. d. II. Centr. Afr. Exped.*, **1** : 631.
Exocentrus (*Camptomyme*) *strigosus* Jordan, Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32**, No. 25 : 16.

Antennes aussi longues que le corps, assez fortes, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue très fortement recourbée et d'une bosse obtuse latérale située avant cette épine. Elytres densément et finement ponctués presque jusqu'au bord apical, les points assez régulièrement alignés.

Brun foncé, couvert de pubescence brun foncé. Chaque élytre avec trois bandes transversales grises, irrégulières et interrompues par places, une postbasilaire, une prémédiane et une postmédiane. L'extrême base des articles antennaires à partir du troisième à pubescence gris blanchâtre.

Long.: 3 mm. 1/2–4 mm.; Larg.: 1 mm. 1/4–1 mm. 1/3.

Décrit sur un individu du Cameroun : Lolodorf, au Muséum de Paris.—*maculatus* Hintz et *marmoratus* Hintz, décrits chacun sur un individu en mauvais état du Cameroun à l'Institut Royal des Sciences Naturelles de Belgique, semblent des synonymes.

71. ***Exocentrus conradti*** Breuning

Exocentrus (*Camptomyme*) *conradti* Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32**, No. 25 : 15

Antennes comparativement peu fortes, un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum très transverse, pourvu d'une épine latérale pointue, assez longue et très fortement recourbée. Elytres densément et très finement ponctués, les points assez régulièrement alignés.

Brun foncé, couvert de pubescence d'un brun assez foncé. Ecusson à pubescence jaune pâle. Elytres parsemés de petites taches jaune pâle, disposées en rangées longitudinales. Sur chaque élytre en outre deux assez larges bandes résultant de l'agglomération de plusieurs petites taches jaune pâle, une prémédiane remontant très obliquement de la suture en direction de l'épaule et une préapicale descendant légèrement de la suture vers la marge externe. L'extrême base des articles antennaires à partir du troisième à pubescence jaune pâle.

Long.: 5 mm.; Larg.: 2 mm. 1/4.

Décrit sur un individu du Cameroun : Johann Albrechtshöhe, à l'Institut Royal des Sciences Naturelles de Belgique.

72. ***Exocentrus ruficornis*** Hintz

Exocentrus ruficornis Hintz, 1919, *Ergebn. d. II. Centr. Afr. Exped.* **1** : 631.

Antennes modérément fortes, un peu moins longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux sensiblement moins longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale très fortement recourbée. Elytres trés densément et très finement ponctués, les points assez régulièrement alignés.

Brun foncé, les palpes et les pattes plutôt rouges, couvert de pubescence brun rougeâtre. L'écusson à pubescence blanche. Chaque élytre avec deux etroites bandes transversales blanchâtres très fortement ondulées, une postbasilaire vague et peu apparente et une médiane assez nette. Les trois premiers articles des antennes d'un rouge assez clair.

Long.: 3 mm.; Larg.: 1 mm. 1/3.

Décrit sur un individu du Cameroun, à l'Institut Royal des Sciences Naturelles de Belgique.

73. ***Exocentrus nigricollis*** Hintz

Exocentrus nigricollis Hintz, 1919, *Ergebn. d. II. Centr. Afr. Exped.* **1** : 630.

Antennes modérément fines, un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une épine latérale pointue, fortement recourbée. Elytres densément et très finement ponctués sur les trois quarts antérieurs, rangées en séries longitudinales régulières.

Brun foncé, le pronotum marbré de jaune pâle. Elytres revêtus de pubescence jaune paille, parsemés de taches minimes brunes et ornés, chacun, de quatre taches brunes, une basilaire discale, une allongée postbasilaire latérale, la plus petite, une large postmédiane de forme irrégulière, la plus grande atteignant parfois presque la suture et une apicale. Pattes rouges à pubescence jaune paille. Antennes rouges à pubescence brun rougeâtre clair, la base des articles à partir du quatrième à pubescence jaune pâle.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/3.

Décrit sur un individu du Cameroun, à l'Institut Royal des Sciences Naturelles de Belgique.—Congo Belge : Kasengi, Albertville, Rutshuru (Musée de Tervueren).

74. ***Exocentrus seriatus*** Jordan

Exocentrus seriatus Jordan, 1903, *Novit. Zool.* **10** : 189.

Antennes peu fortes, un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux aussi longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue, très fortement recourbée et d'une bosse obtuse latérale peu accusée, située avant cette épine. Elytre densément et trés finement ponctués dans les trois quarts antérieurs, éparsément à partir du milieu, les points sérialement disposés.

Rouge, couvert d'une fine pubescence brun rougeâtre clair. Elytres parsemés de petites taches jaune pâle, rangées, sur chacun, en sept séries longitudinales régulières, ces taches plus éparses sur l'emplacement d'une bande postmédiane transversale peu large. En plus sur chaque élytre une tache suturale préapicale jaune pâle plus grande. Scape rouge clair, le base des articles antennaires à partir du troisième à pubescence jaune pâle.

Long.: 4 mm. 1/2 ; Larg.: 1 mm. 1/3.

Décrit sur un individu du Cameroun : Johann Albrechtshöhe, au Muséum de Paris.

75. ***Exocentrus albosignatus*** Lepesme & Breuning

Exocentrus albosignatus Lepesme & Breuning, 1953, *Bull. Soc. ent. Fr.* : 102.

Antennes sensiblement moins longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, très densément et très finement ponctué dans sa moitié postérieure et pourvu d'une très petite épine latérale fortement recourbée. Elytres densément et assez grossièrement ponctués, les points sérialement alignés.

Noir luisant. Elytres parsemés de petites taches blanches. La partie basilaire des articles antennaires, à partir du troisième, couverte de pubescence blanche.

Long.: 3 mm.; Larg.: 1 mm. 2/3.

Décrit sur des individus de Côte d'Ivoire : Adiopodoumé (Muséum de Paris et coll. Lepesme).

76. ***Exocentrus subfasciatus*** Jordan

Exocentrus subfasciatus Jordan, 1894, *Novit. Zool.* **1** : 247.
Exocentrus undulatofasciatus Lepesme & Breuning, 1953, *Bull. Soc. ent. Fr.* : 102, fig. 5.
Exocentrus (*Camptomyme*) *subfasciatus* Jordan, Lepesme & Breuning, 1956, *Bull. Inst. Fr. Afr. noire*, **18**, sér. A, No. 4 : 1134.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux presque quatre fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue, très fortement recourbée. Elytres densément et très finement ponctués, les points subalignés.

Rouge foncé, couvert de pubescence jaune paille, entremélée sur le disque du pronotum de brun rougeâtre clair. Elytres parsemés de très petites taches dénudées. Elytres ornés de plusieures bandes transversales blanchâtres très ondulées, laissant libre surtout une étroite bande transversale postmédiane très ondulée. Moitié basilaire des tibias rouge clair, leur moitié apicale et les tarses brun foncé. Antennes à pubescence brun rouge foncé, la partie basilaire des articles à partir du troisième à pubescence gris blanchâtre.

Long.: 4–5 mm.; Larg.: 1 mm. 1/2 à 2 mm.

Décrit par Jordan sur un individu du Gabon : Kuilu, au Muséum de Paris.—Côte d'Ivoire Adiopodoumé (Muséum de Paris) ; Ile Fernando Poo (Musée de Gênes); Cameroun (Institut Royal des Sciences Naturelles de Belgique). *Exocentrus undulatofasciatus* Lepesme & Breuning est un synonyme.

77. ***Exocentrus nonymoides*** Jordan

Exocentrus nonymoides Jordan, 1894, *Nov. Zool.* **1** : 246.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une épine latérale pointue, fortement recourbée. Elytres très densément et finement ponctués, les points rangés en séries longitudinales sauf dans le tiers sutural.

Brun foncé, revêtu de pubescence brun foncé. Elytres parsemés de très petites taches blanchâtres, rangées en séries longitudinales et condensées, sur chaque élytre, à une étroite bande transversale médiane très ondulée. La base des articles antennaires à partir du troisième à pubescence gris blanchâtre.

Long.: 5–7 mm. 1/2 ; Larg.: 1 mm. 3/4–2 mm. 1/2.

Décrit sur des individus du Gabon : Kuilu, au Muséum de Paris.—Répandu du Dahomey au Congo belge.

78. ***Exocentrus coeruleus*** Breuning

Exocentrus (*Striatexocentrus*) *coeruleus* Breuning, 1955, *Ann. Mus. civ. Stor, Nat. Genova*, **68** : 42.

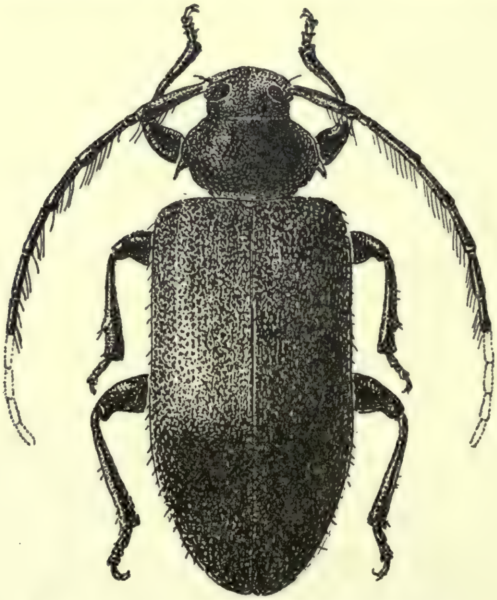

FIG. 2. *Exocentrus coeruleus* Breuning.

Antennes assez fortes, à peine aussi longues que le corps, le troisième article sensiblement moins long que le scape, les articles cinq à sept un peu plus forts que les autres articles. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum presque deux fois plus large que long, très finement chagriné, pourvu d'une petite épine latérale pointue, fortement recourbée et d'une bosse latérale obtuse située avant cette épine. Elytres densément et très finement ponctués, les points sérialement disposés.

Noir, les élytres d'un bleu foncé métallique.

Long.: 4 mm.; Larg.: 1 mm. 2/3.

Décrit sur un individu du Congo francais : Fernand Vaz, au Musée de Gênes.—Gabon : Ivinda (Muséum de Paris) ; Congo belge : Mayidi (Musée de Tervueren).

79. ***Exocentrus albostriatus*** Hintz

Exocentrus albostriatus Hintz, 1919, *Ergebn. d. II. Centr. Afr. Exped.* **1** : 63.

Antennes fortes, un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une épine latérale pointue, dirigée presque directement vers l'arrière. Elytres densément et peu finement ponctués presque jusqu'au bord apical, les points sérialement disposés.

Rouge, couvert d'une fine pubescence rougeâtre. Elytres ornés de nombreuses bandes longitudinales linéiformes jaune blanchâtres, interrompues par places. Pattes et antennes rouge foncé.

Long.: 4 mm.; Larg.: 1 mm. 1/3.

Décrit sur des individus du Cameroun, à l'Institut Royal des Sciences Naturelles de Belgique.

80. ***Exocentrus leucostriatus*** Breuning

Exocentrus (*Camptomyme*) *leucostriatus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 133.

Antennes un peu moins longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée, précédée d'une bosse latérale obtuse mais bien accusée. Elytres densément et très finement ponctués, les points sérialement disposés.

Brun foncé, la moitié latérale de l'élytre rouge clair. Sur chaque élytre sept étroites bandes longitudinales blanches. Tibias rouge clair : l'extrême base des articles antennaires 3 à 8 à pubescence blanche.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/2.

Décrit sur un individu du Congo belge : Tshela au Musée de Tervueren.—Benza-Masola, Yangambi (*idem*) ; Guinée espagnole : Ndeok (Musée de Madrid) ; Gabon : Lambaréné (Muséum de Paris).

81. ***Exocentrus leucolineatus*** Breuning

Exocentrus (*Camptomyme*) *leucolineatus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 133.

Proche de *leucostriatus* Breuning, mais le pronotum ne présente pas de bosse latérale précédant l'épine latérale, et la partie basilaire des articles antennaires 3 à 11 couverte en assez large étendue de pubescence blanchâtre.

Long.: 5 mm.; Larg.: 2 mm.

Décrit sur un individu du Congo belge : Mayidi, au Musée de Tervueren.

82. ***Exocentrus latevittipennis*** Breuning

Exocentrus (*Camptomyme*) *latevittipennis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 11.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale assez longue et pointue légèrement recourbée. Elytres très densément et finement ponctués dans les trois quarts antérieurs, les points subalignés.

Brun foncé, couvert de pubescence brun foncé. Disque du pronotum orné de deux taches discales médianes dorées incurvées (à concavité du côté latéral). Sur chaque élytre le tiers latéral du tiers antérieur et le quart apical sont tres densément marbrés d'ochracé. Dessous du corps et pattes à pubescence grise. Quart basilaire des articles antennaires 3 à 10 revêtu de pubescence blanchâtre.

Long.: 4 mm.; Larg.: 2 mm.

Décrit sur un individu du Congo belge : Lukolela, à l'Institut Royal des Sciences Naturelles de Belgique.

83. ***Exocentrus multivittatus*** Breuning

Exocentrus (*Camptomyme*) *multivittatus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 131.

Antennes aussi longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une assez longue épine latérale dirigée obliquement vers l'arrière. Elytres peu densément et finement ponctués dans les deux tiers antérieurs, les points plus ou moins sérialement disposés.

Rouge, couvert de pubescence brune. Pronotum marbré de jaune paille. Ecusson à pubescence jaune pâle. Sur chaque élytre trois bandes transversales ondulées jaune pâle, une postbasilaire, une médiane et une postmédiane et une tache apicale de même couleur. Base des articles antennaires à partir du troisième à pubescence jaune pâle.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/2.

Décrit sur un individu du Congo belge : Mayidi, au Musée de Tervueren.

84. ***Exocentrus vagemaculatus*** Breuning

Exocentrus (*Camptomyme*) *vagemaculatus* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 11.

Antennes un peu plus longues que le corps ; le troisième article aussi long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum deux fois plus large que long et pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et finement ponctués sur les trois quarts antérieurs, les points sérialement disposés sur les trois quarts latéraux, subalignés sur le quart sutural.

Rouge. Tête et disque du pronotum sauf à son bord antérieur et à son bord postérieur, brun foncé. Sur chaque élytre une tache triangulaire postscutellaire, une grande tache latérale prémédiane et une tache discale postmediane plus petite, d'un brun assez foncé, mais ces taches sont assez vagues. Antennes rembrunis sauf à la base des articles 3 à 11.

Long.: 5 mm. 1/2 ; Larg.: 2 mm.

Décrit sur un individu du Congo belge : Lukolela, à l'Institut Royal des Sciences Naturelles de Belgique.

85. ***Exocentrus niger*** sp. n.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux sensiblement plus longs que les joues. Tête et pronotum à ponctuation extrêmement dense et extrêmement fine. Pronotum deux fois plus large que long, fortement rétréci vers la base, pourvu d'une épine latérale pointue fortement recourbée. Elytres très densément et très finement ponctués, les points sérialement disposés dans les deux tiers latéraux.

Noir luisant. Les bords latéraux de l'écusson rougeâtre à fine pubescence noire.

Long.: 3–4 mm.; Larg.: 1 mm. 1/3–1 mm. 1/2.

Type du Congo belge : Lusinga, 1–8.xii.1947, à l'Institut Royal des Sciences Naturelles de Belgique. Un Paratype (*idem*).

86. ***Exocentrus rufus*** Breuning

Exocentrus (*Camptomyme*) *rufus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 130.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une épine latérale pointue, dirigée obliquement vers l'arrière et précédée d'une bosse latérale obtuse. Elytres très densément et finement ponctués, les points sérialement disposés.

D'un rouge uniforme, la base des articles antennaires à partir du troisième à pubescence blanchâtre.

Long.: 4 mm. 1/2 ; Larg.: 1 mm. 3/4.

Décrit sur un individu du Congo belge : Mayidi, au Musée de Tervueren.— Tshuapa : Flandria (*idem*).

87. ***Exocentrus subrufus*** Breuning

Exocentrus (*Camptomyme*) *subrufus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 130.

Antennes un peu moins longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale fortement recourbée, précédée d'une bosse latérale obtuse. Elytres densément et très finement ponctués, les points sérialement disposés.

Rouge, couvert de pubescence brun rougeâtre. Tete et antennes revêtues de pubescence brun foncé, la base des articles antennaires à partir du troisième à pubescence blanchâtre.

Long.: 3 mm. 1/2 à 4 mm.; Larg.: 1 mm. 1/2 à 1 mm. 2/3.

Décrit sur des individus du Congo belge : Mayidi au Musée de Tervueren.

88. ***Exocentrus rufobasicornis*** Breuning

Exocentrus (*Camptomyme*) *rufobasicornis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 9.

Antennes un peu moins longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale pointue fortement recourbée. Elytres très densément et finement ponctués, les points, sauf dans le quart sutural et sur la partie apicale, sérialement disposés.

Rouge, couvert d'une fine et éparse pubescence gris blanchâtre. Elytres parsemés de très petites taches dénudées. Les premiers articles antennaires rouge clair, les articles à partir du quatrième revêtus de pubescence brun rougeâtre.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/2.

Décrit sur un individu du Congo belge : Lukolela, à l'Institut Royal des Sciences Naturelles de Belgique.

89. ***Exocentrus nigrescens*** Breuning

Exocentrus (*Camptomyme*) *nigrescens* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 130.

Antennes un peu moins longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux aussi longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale conique et pointue, dirigée obliquement vers l'arrière et précédée d'une bosse latérale anguleusement proéminente. Elytres densément et très finement ponctués sur les trois quarts antérieurs, les points subserialement disposés.

Noir mat. Elytres luisants. Ecusson à pubescence blanche. Sur chaque élytre deux étroites bandes transversales blanches, une postbasilaire et une médiane. Quart basilaire du quatrième article des antennes à pubescence blanche.

Long.: 4 mm.; Larg.: 1 mm. 2/3.

Décrit sur un individu du Congo belge : Mayidi, au Musée de Tervueren.

90. ***Exocentrus vagesticticus*** Breuning

Exocentrus (*Camptomyme*) *vagesticticus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 132.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale mince et pointue, faiblement recourbée. Elytres très densément et finement ponctués, les points sérialement disposés.

Brun noir, couvert de pubescence brun foncé. Pronotum rouge. Elytres parsemés de très petites taches blanchâtres peu apparentes, rangés en forme de deux bandes transversales, une postbasilaire ondulée et une postmédiane qui descend obliquement de la suture en direction de la marge externe.

Long.: 3 mm. 1/2-4 mm.; Larg.: 1 mm. 1/3-1 mm. 1/2.

Décrit sur des individus du Congo belge : Mayidi, au Musée de Tervueren.

91. ***Exocentrus schoutedeni*** Breuning

Exocentrus (*Camptomyme*) *schoutedeni* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 131.

Antennes un peu moins longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum transverse, pourvu d'une épine latérale mince et pointue, dirigée obliquement vers l'arrière. Elytres densément et très finement ponctués sur les trois quarts antérieurs les points sérialement disposés.

Noir ; hanches et partie basilaire des fémurs rouge. Ecusson à pubescence blanche. Elytres ornés de dessins blancs. Sur chaque élytre une petite tache suturo- postscutellaire, une petite tache latéro-posthumérale et deux étroites bandes transversales, une postbasilaire et une médiane droites dans la moitié latérale, sensiblement inclinées l'une vers l'autre sans toutefois se toucher dans la moitié suturale.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/2.

Décrit sur un individu du Congo belge : Mongende, au Musée de Tervueren.

92. ***Exocentrus vaneyeni*** Breuning

Exocentrus (*Camptomyme*) *vaneyeni* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 132.

Antennes aussi longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale pointue, dirigée obliquement vers l'arrière. Elytres très densément et finement ponctués, les points plus ou moins sérialement disposés sur les quatre cinquièmes antérieurs.

Brun noir. Pronotum rouge, rembruni souvent au centre. Sur chaque élytre deux assez larges bandes transversales ondulées blanchâtres peu apparentes, une postbasilaire et une juste après le milieu.

Long.: 3–4 mm.; Larg.: 1 mm. 1/3–1 mm. 1/2.

Décrit sur des individus du Congo belge : Mayidi, au Musée de Tervueren.— Lukombe (*idem*).

93. ***Exocentrus albostictipennis*** nom. nov.

Exocentrus (*Camptomyme*) *albosticticus* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33** : 11.

Antennes aussi longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum faiblement transverse, pourvu d'une très petite épine latérale mince et pointue, dirigée obliquement vers l'arrière. Elytres densément et finement ponctués sur les deux tiers antérieurs, les points sérialement disposés.

Noir, garni de poils dressés noirs. Elytres rouge foncé et parsemés de petites taches blanches sur les deux tiers antérieurs, ces taches plus serrés au bord postérieur du deuxième tiers. Pattes et antennes rouge foncé.

Long.: 3 mm.; Larg.: 1 mm. 1/3.

Décrit sur un individu du Congo belge : Elisabethville, à l'Institut Royal des Sciences Naturelles de Belgique.

94. ***Exocentrus flavofasciatus*** Breuning

Exocentrus (*Camptomyme*) *flavofasciatus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 131.

Antennes aussi longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale pointue, dirigée obliquement vers l'arrière. Elytres densément et très finement ponctués, les points sérialement disposés.

Tête brun foncé. Pronotum rouge. Elytres brun jaunâtre et ornés, chacun, d'une assez large bande transversale prémédiane jaune qui remonte obliquement de la suture en direction de la marge externe. Antennes rouge foncé.

Long.: 3–4 mm.; Larg.: 1 mm. 1/3–1 mm. 2/3.

Décrit sur des individus du Congo belge : Mayidi, au Musée de Tervueren.

95. ***Exocentrus variegatus*** Duvivier

Exocentrus variegatus Duvivier, 1891, *Ann. Soc. ent. Belg.* **35** ; *Bull.*: 421 ; 1892, *Ann. Soc. ent. Belg.* **36** : 365.
Exocentrus brevis Jordan, 1894, *Novit. Zool.* **1** : 247.
Exocentrus bifasciatus Lepesme & Breuning, 1953, *Bull. Soc. ent. Fr.* : 101.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois ou quatre fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une épine latérale pointue, très fortement recourbée et précédée d'une bosse latérale anguleuse. Elytres densément et très finement ponctués, les points, sauf dans le quart sutural, sérialement disposés.

Rouge, couvert d'une fine pubescence jaune pâle, très fine sur le pronotum, disposée sur les élytres sous forme de neuf assez larges bandes transversales peu régulières. Elytres parsemés de très petites taches dénudées. Articles antennaires à partir du troisième à pubescence jaune pâle.

Long.: 4–5 mm. 1/2 ; Larg.: 1 mm. 1/4–1 mm. 3/4.

Décrit sur un individu du Congo belge : Ibembo, à l'Institut Royal des Sciences Naturelles de Belgique.—Répandu de Côte d'Ivoire au Transvaal et du Transvaal jusqu'en Abyssinie. *Exocentrus brevis* Jordan et *bifasciatus* Lepesme & Breuning sont des synonymes.

96. ***Exocentrus grossepunctatus*** Breuning

Exocentrus grossepunctatus Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 10.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux presque deux fois plus longs que les joues. Tête et pronotum très densément et extrêmement finement ponctués. Pronotum plus de deux fois plus large que long, pourvu d'une courte épine latérale conique pointue ; fortement recourbée. Elytres très densément et grossièrement ponctués sur les quatre cinquièmes antérieurs, finement dans le cinquième apical, les points sérialement disposés.

Brun foncé, couvert de pubescence brun foncé. Occiput rouge. Sur chaque élytre trois bandes transversales blanchâtres floues, une assez large postbasilaire, une étroite médiane fortement ondulée et une très large préapicale. Les poils dressés du dessus du corps noirs, ceux du bord latéral des élytres, du dessous et des pattes blancs. La partie basilaire des tibias rougeâtre. Les deux tiers basilaires des articles antennaires 3 et 4 et le tiers basilaire des articles suivants à pubescence blanche.

Long.: 8 mm. 1/2 ; Larg.: 3 mm. 1/2.

Décrit de Rhodésie : Plumtrees, 21.x.1905, leg. S. O.Neil, au British Muséum.

97. ***Exocentrus echinulus*** Gahan

Exocentrus echinulus Gahan, 1904, *Distant, Ins. Transvaal* : 156, pl. 15, fig. 12.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue, fortement recourbée. Tête et pronotum à ponctuation très dense et extrêmement fine. Elytres très densément et grossièrement ponctués, les points plus ou moins régulièrement alignés.

Rouge foncé, l'épaule, la moitié basilaire des tibias et les articles antennaires 3 et 4 rouge clair. Le dessus couvert d'une fine pubescence blanchâtre. Elytres parsemés de très petites taches dénudées serrées. Sur chaque élytre une assez étroite bande transversale postmédiane ondulée brune. La moitié apicale des tibias, les tarses et les antennes à pubescence brun foncé. La moitié basilaire des articles antennaires 3 et 4 et la base des articles suivants à pubescence blanche.

Long.: 8 mm.; Larg.: 3 mm.

Décrit sur des individus du Transvaal : Waterberg District, au Musée de Pretoria.—Natal : Ladysmith (coll. Hunt) ; Betschuanaland : Sekhuma (coll. Frey).

98. ***Exocentrus exiguus*** Gahan

Exocentrus exiguus Gahan, 1904, *Ins. Transvaal* : 156, pl. 15, fig. 14.

Proche d'*echinulus* Gahan, mais sensiblement plus petit, les antennes moins longues que le corps. L'epaule non rouge, l'épine latérale du pronotum un peu moins recourbée ; sur chaque elytre en plus quelques taches brunes entre la bande postmédiane et l'apex., la bande située un peu plus en avant.

Long.: 4 mm. 1/2 ; Larg.: 2 mm.

Décrit sur un individu de Transvaal : Waterberg District, au Musée de Pretoria.

99. ***Exocentrus aureomaculatus*** Aurivillius

Exocentrus aureomaculatus Aurivillius, 1914, *Ark. f. Zool.* **9/8** : 14.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux cinq fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une assez longue épine latérale pointue fortement recourbée. Elytres densément et finement ponctués, les points sérialement disposés.

Noir, couvert de pubescence brun foncé. Elytres ornés de nombreuses assez petites taches quadrangulaires gris clair disposées, sur chacun, en six séries longitudinales. L'écusson et les premieres et la dernière taches de la sixième rangée de couleur doré-ochracé vif, la dernière tache de la cinquième rangée jaune. L'extrême base des articles antennaires à partir du troisième à pubescence blanche.

Long.: 7 mm.; Larg.: 2 mm. 2/3.

Décrit sur un individu du Nyassaland : Mlanje au British Muséum.

100. ***Exocentrus rhodesianus*** Breuning

Exocentrus (*Camptomyme*) *rhodesianus* Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32,** No. 25 : 14 ; 1956, *Bull. Soc. ent. Fr.* **61** : 175.

Antennes un peu plus longues que le corps, peu fortes, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une assez longue épine latérale fortement recourbée. Elytres densément et finement ponctués, les points subalignés.

Rouge foncé, couvert de pubescence brun foncé, entremelée d'un peu de gris. Ecusson revêtu de pubescence blanche. Sur chaque élytre deux assez larges bandes transversales blanches : une prémédiane descendant très obliquement de l'épaule en direction de la suture et une postmédiane faiblement ondulée. Moitié basilaire des tibias rouge clair. La partie basilaire du scape et des articles antennaires à partir du cinquième, le deuxième article et le tiers basilaire des articles 3 et 4, rouge clair et couverts de pubescence blanchâtre.

Long.: 6 mm.; Larg.: 2 mm. 1/4.

Décrit sur un individu de South Rhodésie : Khami, au Musée de Bulawayo.

101. ***Exocentrus subseriatus*** Hunt & Breuning

Exocentrus subseriatus Hunt & Breuning, 1957, *Durban Mus. Novit,* **5** : 66.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes Inférieurs des yeux un peu plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale pointue très fortement recourbée. Elytres densément et très finement ponctués dans les trois quarts antérieurs, les points sérialement disposés.

Tête noirâtre. Pronotum rouge. Elytres rouge foncé, couverts d'une pubescence brun foncé et ornés dans la moitié antérieure de nombreuses petites taches blanches rangées en séries longitudinales, de quelques taches pareilles le long de la suture dans le quart apical et de plusieures taches pareilles en forme d'une bande transversale postmédiane peu large. Les pattes rouge clair. Les articles antennaires 2 à 4 rouge clair, les articles 7 à 11 brun foncé, les autres articles d'un rouge assez clair, rembrunis partiellement.

Long.: 3 mm. 1/2–4 mm.; Larg.: 1 mm. 1/3–1 mm. 1/2.

Décrit sur des individus de Zululand : Mlubhove (leg. Hunt), dans la coll. Hunt.

102. ***Exocentrus fuscosignatipennis*** Hunt & Breuning

Exocentrus fuscosignatipennis Hunt & Breuning, 1957, *Durban Mus. Novit.* **5** : 65.

Antennes comparativement fines, un peu plus longues que le corps, le troisième article à peine aussi long que le premier. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale pointue faiblement recourbée. Elytres densément et très finement ponctués, le points, sauf au quart sutural, disposés sérialement.

Rouge foncé, couvert de pubescence brun foncé. Ecusson à pubescence jaune paille. Elytres, pattes et antennes rouges, revêtus de pubescence brune. Elytres parsemés de petites taches jaune paille serrées rangées en séries longitudinales et ornés, chacun, d'une tache longitudinale brun foncé à côté de l'écusson et d'une bande transversale postmédiane brun foncé fortement ondulée. Le tiers apical des tibias et les tarses à pubescence brun foncé. L'extrême des articles antennaires à partir du troisième à pubescence jaune paille.

Long.: 4 mm. 1/2 ; Larg.: 1 mm. 2/3.

Décrit sur des individus de Natal : Richmond (leg. Hunt), dans la coll. Hunt.

103. ***Exocentrus substrigosus*** Hunt & Breuning

Exocentrus substrigosus Hunt & Breuning, 1957, *Durban Mus. Novit,* **5** : 67.
Exocentrus inclusus Fahraeus (nec Pascoe), 1872, *Oefvers. Vet. Ak. Förh.* **29/2** : 49.

Antennes un peu plus longues que le corps, comparativement fines, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une épine latérale pointue très fortement recourbée et précédée d'une bosse latérale obtuse à peine accusée. Elytres très densément et finement ponctués presque jusqu'au bord apical, les points sérialement disposés.

Brun foncé, le bord antérieur et le bord postérieur du pronotum, les tibias et les antennes, sauf les derniers articles, rouges. Ecusson couvert de pubescence blanche. Chaque élytre orné de deux assez larges bandes transversales blanchâtres, une prémédiane qui remonte obliquement en direction de la marge externe et une postmédiane fortement ondulée.

Long.: 4 mm. 1/2 ; Larg.: 2 mm.

Décrit sur des individus de Natal : Richmond (leg. Hunt), dans la coll. Hunt.

104. *Exocentrus murinus* (Hintz i.l.) Breuning

Exocentrus (*Camptomyme*) *murinus* (Hintz i.l.) Breuning, *Bull. Inst. roy. Sc. nat. Belg.* **32**, No. 25 : 16.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une épine latérale pointue, fortement recourbée. Elytres densément et très finement ponctués sur les trois quarts antérieurs, les points régulièrement alignés sur les trois quarts latéraux.

Tête et pronotum rouges à pubescence soyeuse jaunêtre. Elytres revêtus de pubescence jaune paille, parsemés de nombreuses très petites taches dénudées et ornés, chacun de trois taches brunes assez floues, une basilaire discale, une postmédiane latérale et une apicale.,

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/3.

Type du Natal à l'Institut Royal des Sciences Naturelles de Belgique.—Durban (Muséum de Paris) ; Zululand (British Muséum).

105. *Exocentrus subinclusus* Hunt & Breuning

Exocentrus subinclusus Hunt & Breuning, 1957, *Durban Mus. Novit.* **5** : 65.

Antennes un peu plus longues que le corps, comparativement fines, le troisième article aussi long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum transverse, pourvu d'une très mince épine latérale faiblement recourbée. Elytres densément et très finement ponctués, les points sérialement disposés.

Brun foncé, couvert de pubescence brun foncé. Sur chaque élytre trois bandes transversales ondulées gris blanchâtres : une postbasilaire, une prémédiane et une postmédiane, les deux antérieures très rapprochées l'une de l'autre et remontant faiblement en direction de l'épaule. La partie basilaire des tibias et l'extrême base des articles antennaires à partir du troisième, rouges.

Long.: 3–4 mm. 1/2 ; Larg.: 1 mm. 1/4.1 mm. 2–3.

Décrit sur des individus de Natal : Richmond (leg. Hunt) dans la coll. Hunt.—Zululand : Kambala (*idem*).

var. ***latefasciatus*** Hunt & Breuning

Exocentrus (*Camptomyme*) *subinclusus* Hunt & Breuning var. *latefasciata* Hunt & Breuning, 1957, *Durban, Mus. Novit.* **5** : 66.

Comme la forme typique, mais la bande postmédiane blanchâtre de l'élytre droite, non ondulée et encore plus large.

Natal : Queenstown (leg. Hunt) (coll. Hunt).

106. ***Exocentrus sjöstedti*** Breuning

Exocentrus (*Striatexocentrus*) *sjöstedti* Breuning, 1955, *Ark. f. Zool.* (2) **7**, No. 29 : 590.

Antennes un peu plus longues que le corps, comparativement fines, le troisième article un peu moins long que le premier. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale pointue, très fortement recourbée et précédée d'une bosse latérale obtuse. Elytres densément et finement ponctués, les points plus ou moins sérialement disposés.

Rouge, couvert d'une fine pubescence soyeuse grise, cette pubescence condensée sur les élytres pour y former plusieures bandes transversales ondulées floues, dont deux situées dans la moitié apicale, l'une juste après l'autre. Antennes rouge clair.

Long.: 3 mm.; Larg.: 1 mm.

Décrit sur un individu du Tanganyika : Mt. Meru, au Riksmuséum de Stockholm.

107. ***Exocentrus orientalis*** Breuning

Exocentrus (*Striatexocentrus*) *orientalis* Breuning, 1955, *Ark. f. Zool.* (2) **7**, No. 29 : 589.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux presque quatre fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une assez longue épine latérale pointue, dirigée presque directement vers l'arrière. Elytres densément et très finement ponctués, les points subalignés.

Rouge foncé, le dessus du corps et le scape couverts d'une pubescence gris blanchâtre entremélée de jaunâtre sur le disque du pronotum. Dessous du corps, pattes et le restant des antennes a pubescence jaune pâle. Elytres parsemés de petites taches dénudées et ornés, chacun d'une bande transversale postmédiane brun rougeâtre descendant très obliquement en direction de la suture et d'une large bande longitudinale latérale brun rougeâtre parcourant les deux tiers antérieurs. La partie basilaire des articles antennaires à partir du troisième revêtue de pubescence blanchâtre, en plus large étendue sur les articles 3 à 9.

Long.: 5 mm.; Larg.: 2 mm.

Décrit sur un individu du Tanganyika : Namupa, au Riksmuseum de Stockholm.

108. ***Exocentrus jeanneli*** Breuning

Exocentrus (*Striatexocentrus*) *jeanneli* Breuning, 1955, *Rev. franc. d'Ent.* **22** : 121, fig. 2.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum presque deux fois plus large que long, très densément et extrêmement finement ponctué, pourvu d'une petite épine latérale pointue fortement recourbée. Elytres très densément et peu finement ponctués, les points sérialement disposés sauf dans le tiers sutural.

Brun foncé, couvert de pubescence rousseâtre. Elytres revêtus de pubescence jaune paille, entremélée de blanchâtre et parsemés de très petites taches dénudées, rangées en séries longitudinales ; le tiers sutural de la moitié antérieure et une large bande transversale postmédiane qui descend obliquement en direction de la marge externe, couverts de pubescence brune. Pattes et antennes à pubescence brun foncé, la moitié basilaire des tibias rouge, la partie basilaire des articles antennaires à partir du troisième à pubescence jaune blanchâtre.

Long.: 5 mm.; Larg.: 2 mm. 1/2.

Décrit sur un individu du Tanganyika : Kilema, Kilimandjaro, versant Sud-Est, 1440 m. alt., au Muséum de Paris.

109. ***Exocentrus gardnerianus*** nom. n.

Exocentrus (*Camptomyme*) *gardneri* Breuning, 1958, *Bull. Inst. roy. Sc. Nat. Belg.* **34**, No. 22 : 38.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue très fortement recourbée et précédée d'une bosse latérale obtuse. Elytres densément et finement ponctués, les points régulièrement alignés.

Brun foncé, couvert de pubescence gris blanchâtre. Disque du pronotum avec quatre bandes longitudinales brun foncé floues, deux ondulées rapprochées de la ligne médiane et deux latérales. Chaque élytre avec une large bande transversale postmédiane ondulée brun foncé et une grande tache discale préapicale de même couleur. La moitié basilaire des fémurs et les tibias rouge clair. Les poils dressés du dessus noirs, ceux du bord latéral et des pattes blanchâtres. Antennes à pubescence brun foncé, la base des articles 3 à 11 à pubescence blanchâtre.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/3.

Décrit sur un individu du Tanganyika : Serengeti, ex *Acacia* sp., 22.xii.1955, leg. J. C. M. Gardner au British Muséum.

110. ***Exocentrus pseudonitens*** Breuning

Exocentrus (*Camptomyme*) *pseudonitens* Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32**, No. 25 : 14.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus que les joues. Pronotum transverse, pourvu d'une petite épine latérale mince faiblement recourbée. Elytres très densément et finement ponctués, les points sérialement disposés sauf dans le quart sutural.

Brun foncé. Chaque élytre orné de deux bandes transversales gris clair, très rapprochées l'une de l'autre, une postbasilaire et une prémédiane. L'extrême base des articles antennaires à partir du troisième à pubescence gris blanchâtre.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/2.

Décrit sur un individu du Kenya : Mutha, au British Muséum.

111. ***Exocentrus aureopilosus*** Breuning

Exocentrus (*Striatexocentrus*) *aureopilosus* Breuning, 1955, *Ark. f. Zool.* (2) **7**, No. 29 : 589.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois et demie plus longs que les joues. Tête peu densément et finement ponctuée. Pronotum presque deux fois plus large que long, éparsément et peu finement ponctué, pourvu d'une épine latérale conique pointue fortement recourbée. Elytres densément et finement ponctués, les points plus ou moins régulièrement alignés. Tous les poils dressés de couleur dorée.

Brun foncé, couvert d'une pubescence brune. Le disque du pronotum et les élytres parsemés de très petites taches dénudées et avec quelques très petites taches blanches. Sur chaque élytre une assez large bande transversale ondulée blanche située un peu après le milieu. La moitié basilaire des tibias couverte de pubescence blanche, leur moitié apicale, les tarses et la moitié apicale des articles antennaires revêtus de pubescence brun foncé. La moitié basilaire des articles antennaires à pubescence blanche.

Long.: 9 mm.: Larg.: 3 mm. 1/2.

Décrit sur un individu du Kenya : Ikutha, au Riksmuseum de Stockholm.

112. ***Exocentrus alluaudi*** Breuning

Exocentrus (*Striatexocentrus*) *alluaudi* Breuning, 1955, *Rev. franc. d'Ent.* **22** : 122.

Antennes aussi longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum faiblement transverse, pourvu d'une petite épine latérale mince et pointue, dirigée obliquement vers l'arrière. Elytres très densément et finement ponctués, les points sérialement disposés sauf sur le quart sutural.

Rouge foncé, couvert de pubescence brun foncé. Les deux tiers antérieurs des élytres parsemés de petites taches irrégulières blanches. Les deux premiers articles antennaires rouge clair.

Long.: 3 mm.; Larg.: 1 mm. 1/4.

Décrit sur un individu du Kenya : Shimoni, au Muséum de Paris.

113. ***Exocentrus fuscovittatus*** Breuning

Exocentrus fuscovittatus Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 9.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue fortement recourbée, précédée d'une bosse latérale obtuse. Elytres densément et finement ponctués, les points régulièrement alignés dans les deux tiers latéraux, subalignés dans le tiers sutural.

Brun foncé, couvert d'une pubescence d'un brun assez foncé. Le pronotum et la strie suturale à pubescence rougeâtre. Les deux tiers latéraux des élytres revêtus de pubescence soyeuse brun clair et parsemés de taches minimes brun foncé. Le tiers sutural des élytres et les antennes a pubescence brun foncé.

Long.: 6 mm.: Larg.: 2 mm. 1/4.

Type du Kenya : Sobatia, 30.iv.1955, ex Climber, leg. J. C. M. Gardner, au British Muséum.—Un Paratype (*idem*).

114. ***Exocentrus sudanicus*** Aurivillius

Exocentrus sudanicus Aurivillius, 1927, *Ark. f. Zool.* **19A/17** : 26, fig. 177.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une épine latérale pointue très fortement recourbée. Elytres densément et très finement ponctués, les points plus ou moins alignés.

Brun foncé, couvert de pubescence brun clair. Disque du pronotum et élytres parsemés de taches vagues plus ou moins grandes brun foncé, dont une triangulaire prémédiane latérale, sur chaque élytre, est plus grande et plus accusée. Moitié apicale des tibias, les tarses, un large anneau postmédian sur le scape et les deux tiers apicaux des articles antennaires deux à onze, brun foncé.

Long.: 7–9 mm.; Larg.: 3–3 mm. 1/3.

Décrit sur un individu du Soudan : Malakul et Mongalla, au Riksmuseum de Stockholm.—Kenya : Kampi ya Moto (British Muséum).

115. ***Exocentrus raffrayi*** Breuning

Exocentrus (*Camptomyme*) *raffrayi* Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32**, No. 25 : 16.

Antennes comparativement fines, un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux presque trois fois plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une petite épine latérale pointue, fortement recourbée. Elytres densément et très finement ponctués, les points sérialement disposés sauf dans le tiers sutural.

Rouge, couvert d'une fine pubescence jaune blanchâtre. Pronotum avec deux larges bandes longitudinales brun rougeâtres floues peu régulières, très rapprochées de la ligne médiane. Sur chaque élytre une tache vague à côté de l'écusson, une tache prémédiane latérale, une tache discale préapicale et une étroite bande postmédiane, formant avec celle de l'autre élytre un grand *M* ; tous ces dessins brun rougeâtre. Antennes à pubescence brun rougeâtre, l'extrême base des articles à partir du troisième à pubescence jaune pâle.

Long.: 4 mm.; Larg.: 1 mm. 2/3.

Décrit sur un individu d'Abyssinie, à l'Institut Royal des Sciences Naturelles de Belgique.

116. *Exocentrus pseudomurinus* sp. n.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux plus de deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite et mince épine latérale, faiblement dirigée vers l'arrière. Elytres très densément et très finement ponctués, les points sérialement disposés sauf sur le quart sutural.

Rouge clair, couvert d'une fine pubescence blanchâtre. Elytres parsemés de petites taches dénudées rangées en séries longitudinales et avec, sur chacun, une assez grande tache médiane discale dénudée. Antennes à pubescence brun rougeâtre clair à partir du troisième article sur les deux tiers apicaux.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/3.

Type de Djibouti : Jardin d'Ambouli, 1897, leg. Ch. Alluaud au Muséum de Paris.

117. *Exocentrus lineolatus* Müller

Exocentrus lineolatus Müller, 1939, *Miss. Biol. paese Borana, Recc. Zool.* **2/1** : 74, pl. 4, fig. 3.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et finement ponctués, les points sérialement disposés.

Brun foncé, couvert d'une pubescence brun clair. Le disque du pronotum et les élytres parsemés de petites taches noirâtres. Elytres ornés en plus d'étroites taches longitudinales blanches, rangées sur chaque élytre en forme de sept bandes longitudinales. Tiers apical des tibias, les tarses et le tiers apical des articles antennaires à pubescence brun foncé. L'extrême base des articles antennaires à partir du troisième à pubescence blanchâtre.

Long.: 5 mm. 1/2—6 mm. 1/4 ; Larg.: 2 mm. 1/3–2 mm. 2/3.

Décrit sur des individus d'Abyssinie : Arero, au Musée de Trieste.

118. *Exocentrus vittatus* Fisher

Exocentrus vittatus Fisher, 1931, *Ind. For. Rec.* **16** : 296, 306.

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et finement ponctués dans les deux tiers antérieurs, les points sérialement disposés.

Rouge. Chaque elytre orné de sept étroites bandes longitudinales blanchâtres. La base des articles antennaires 4 à 11 à pubescence blanchâtre.

Long.: 4 mm. 1/2–6 mm.; Larg.: 1 mm. 1/2– 2 mm. 1/4.

Décrit sur des individus de l'Inde : Madras, N. Salem et Fraserpet : Coorg, au British Muséum, au Musée de Dehra Dun et au Musée de Washington.

119. ***Exocentrus chatterjeei*** Fisher

Exocentrus chatterjeei Fisher, 1940, *Ind. For. Rec.* (2) **7** : 210.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum transverse, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et assez grossièrement ponctués, les points sérialement disposés.

Rouge, couvert de pubescence brun rougeâtre. Sur chaque élytre cinq rangées longitudinales de petites taches jaune blanchâtres, ces taches interrompues sur l'emplacement d'une bande transversale située un peu après le milieu.

Long.: 4 mm. 1/2–5 mm.; Larg.: 1 mm. 3/4–2 mm.

Décrit sur des individus de l'Inde : Madras, Nilambur au British Muséum, au Musée de Dehra Dun et au Musée de Washington.

120. ***Exocentrus ficicola*** Fisher

Exocentrus ficicola Fisher, 1932, *Ind. For. Rec.* **16** : 296, 315.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue fortement recourbée. Elytres assez densément et très finement ponctués dans les trois quarts antérieurs, les points sérialement disposé.

Brun, couvert d'une fine pubescence jaune paille. Elytres revêtus d'une pubescence brun rougeâtre et ornés de taches jaunes qui manquent cependant sur l'emplacement d'une grande plaque quadrangulaire située un peu après le milieu. Antennes à pubescence brun rougeâtre clair, la base des articles à partir du troisième à pubescence jaune pâle.

Long.: 3 mm. 1/2–6 mm. 1/2 ; Larg.: 1–2 mm. 1/2.

Décrit sur des individus de l'Inde : Bamboi, W. Thana, Bombay, au British Muséum, au Musée de Dehra Dun et au Musée de Washington.—Dehra Dun (Musée de Dehra Dun).

121. ***Exocentrus carissae*** Fisher

Exocentrus carissae Fisher, 1932, *Ind. For. Rec.* **16** : 296, 312.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus long que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale pointue fortement recourbée. Elytres densément et peu finement ponctués, les points sérialement disposés sauf dans le quart sutural.

Rouge foncé, couvert d'une fine pubescence gris clair. Elytres revêtus d'une pubescence brun rougeâtre foncé et ornés, chacun, de trois bandes transversales gris clair, une postbasilaire remontant obliquement en direction de l'épaule, une médiane ondulée et une préapicale droite dans la moitié suturale ensuite brusquement courbée vers l'arrière pour atteindre le bord apical. Antennes à pubescence d'un brun assez foncé, la base des articles à partir du troisième à pubescence gris clair.

Long.: 3 mm. 1/2–3 mm. 3/4 ; Larg.: 1 mm. 1/4–1 mm. 1/2.

Décrit sur des individus de l'Inde : environs de Dehra Dun, au British Muséum, au Musée de Dehra Dun et au Musée de Washington.

122. ***Exocentrus alboscutellaris*** sp. n.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale mince et pointue fortement recourbée. Elytres densément et finement ponctués, les points sérialement disposés sauf sur le quart sutural.

Noir, couvert de pubescence gris foncé. Ecusson à pubescence blanche. Elytres revêtus de pubescence brun foncé et ornés, chacun, de trois bandes transversales blanches peu larges : une postbasilaire et une médiane, ces deux fortement ondulées et reliées le long du milieu du disque par de petites taches blanches, et une préapicale incurvée (à concavité du côté basal). Moitié apicale des tibias, les tarses et les antennes à pubescence brun foncé, l'extrême base des articles antennaires à partir du troisième à pubescence gris clair.

Long.: 4 mm.; Larg.: 1 mm. 1/2.

Type un individu des Iles Andamanes, ex dead Teak stump, 3.x.1955, au Musée de Dehra Dun.

123. ***Exocentrus explanatidens*** Pic

Exocentrus explanatidens Pic, 1930, *Sborn. ent. odd, Nar. Mus. Praze,* **8** : 58.

Antennes d'un tiers plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux sensiblement plus longs que les joues. Pronotum plus de deux fois plus large que long, son bord latéral largement aplati et rebordé, pourvu d'une longue et mince épine latérale pointue, dirigée directement vers l'arrière. Elytres densément et finement ponctués sur les deux tiers antérieurs, les points sérialement disposés sauf sur le quart sutural.

Brun foncé. Tête et pronotum rouges à fine pubescence dorée. Ecusson et la strie suturale des élytres couverte de pubescence blanchâtre. Elytres revêtus de pubescence brun foncé et ornés, chacun, de deux bandes transversales gris blanchâtres peu apparentes, une postbasilaire faiblement recourbée dans la région suturale et une médiane ondulée. Pattes et antennes à pubescence brun foncé.

Long.: 4 mm.; Larg.: 1 mm. 3/4.

Décrit sur un individu de l'Inde : Sikkim, Kurseong, au Musée de Prague.—Bhutan (coll. Frey).

124. ***Exocentrus birmanus*** Breuning

Exocentrus (*Camptomyme*) *birmanus* Breuning, 1958, *Bull. Inst. roy. Sc. nat. Belg.* **34**, No. 22 : 39.

Antennes d'un quart plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues.

Pronotum fortement transverse, pourvu d'une épine latérale pointue assez longue et faiblement recourbée. Elytres densément et finement ponctués, les points sérialement disposés sauf sur le quart sutural.

Rouge. Front, parties latérales du pronotum et dessous du corps revêtus d'une fine pubescence grise, le dessus du corps, les pattes et les antennes à pubescence brun rouge. Pronotum avec deux taches discales grisâtres vagues et une très étroite bande longitudinale grise. Ecusson à pubescence blanche. Sur chaque élytre une très étroite bande longitudinale suturale blanche parcourant plus du tiers basilaire et trois bandes transversales blanches : une postbasilaire remontant obliquement en direction de la marge externe, une médiane très fortement ondulée et une préapicale ondulée.

Long.: 5 mm.; Larg.: 2 mm. 1/4.

Décrit sur un individu de Birmanie : Bhamò, à l'Institut Royal des Sciences Naturelles de Belgique.

125. ***Exocentrus trifasciellus*** Gressitt

Exocentrus trifasciellus Gressitt, 1940, *Philipp. Journ. Sc.* **72** : 184, 187, pl. 5, fig. 17 ; 1951, *Longicornia,* **2** : 526.

Antennes de moitié plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une courte épine latérale pointue, dirigée vers l'arrière. Elytres assez densément et finement ponctue's les points subalignés.

Brun rougeâtre. Tête, la partie apicale des élytres et la partie apicale des tibias noirâtres. Les hanches, la partie basilaire des tibias et les antennes rougeâtres. Sur chaque élytre des taches jaunes rangées en forme de trois bandes transversales, une postbasilaire, une prémédiane et une postmédiane.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/4.

Décrit sur un exemplaire de Chine : Ile Hainan, à l'Académie de Californie.

Je ne connais cette espèce que d'après la description.

126. ***Exocentrus basirufus*** Gressitt

Exocentrus basirufus Gressitt, 1940, *Philipp. Journ. Sc.* **72** : 184, 185, pl. 5, fig. 16 ; 1951, *Longicornia,* **2** : 526.

Antennes d'un quart plus longues que le corps, le troisième article un peu moins long que le scape. Pronotum fortement transverse, pourvu d'une mince épine latérale pointue, dirigée obliquement vers l'arrière. Elytres assez densément et peu finement ponctués, les points sérialement disposés.

Brun rougeâtre. Tête, pronotum et moitié postérieure des élytres brun noir. Sur chaque élytre trois étroites bandes transversales blanches, une postbasilaire, une postmédiane et une préapicale.

Long.: 3–4 mm.; Larg.: 1–1 mm. 1/2.

Décrit sur un individu de Chine : Ile Hainan, au Musée de Washington.—Prov. Kwang-tung, near Mei-hsien (Gressitt).

Je ne connais cette espèce que d'après la description.

127. ***Exocentrus constricticollis*** Gressitt

Exocentrus constricticollis Gressitt, 1940, *Philipp. Journ. Sc.* **72** : 184, 186, pl. 5, fig. 12 ; 1951, *Longicornia*, **2** : 527.

Troisième article des antennes sensiblement moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum transverse, pourvu d'une épine latérale pointue, dirigée obliquement vers l'arrière. Elytres finement ponctués, les points sérialement disposés.

Brun foncé. Tête noirâtre. Pronotum brun rouge, marbré de jaune pâle. Elytres revêtus de pubescence brun jaunâtre et ornés, chacun, d'une grande tache postmédiane latérale brun foncé, d'une autre tache pareille apicale ainsi que de quelques très petites taches brun foncé. Antennes à pubescence brun rougeâtre, la partie apicale des articles brun foncé.

Long.: 4 mm.; Larg.: 1 mm. 1/2.

Décrit sur un individu de Chine : Ile Hainan, à l'Académie de Californie.

Je ne connais cette espèce que d'après la description.

128. ***Exocentrus hupehensis*** Gressitt

Exocentrus hupehensis Gressitt, 1951, *Longicornia*, **2** : 526, 528, pl. 19, fig. 1.

Antennes d'un tiers plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois et demie plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une courte épine latérale pointue, dirigée directement vers l'arrière. Elytres assez densément et finement ponctués, les points sérialement disposés sauf sur le quart sutural.

Brun rougeâtre foncé, couvert d'une fine pubescence gris clair. Elytres à pubescence brun rougeâtre et ornés, chacun, de trois bandes transversales zigzaguées pâles, une postbasilaire une postmédiane et une préapicale. La partie basilaire des articles antennaires à pubescence plus claire.

Long.: 4 mm. 1/2 ; Larg. : 1 mm. 1/2.

Décrit sur des individus de Chine : Province de Hupeh, District de Lichuan, à l'Académie de Californie.

Je ne connais cette espèce que d'après la description.

129. ***Exocentrus subbidentatus*** Gressitt

Exocentrus subbidentatus Gressitt, 1937, *Lingn. Sc. Journ.* **16** : 615 ; 1939, *Lingn. Sc. Journ.*, **18** : 86 ; 1942, *Lingn. Nat. Hist. Surv. Mus,. Spec. Publ.*, No. 8 : 30,; 1951, *Longicornia*, **2** : 526.

Antennes d'un tiers plus longues que le corps, le troisième article aussi long que le scape. Pronotum presque deux fois plus large que long, pourvu d'une assez longue épine latérale pointue, dirigée vers l'arrière, précédée d'une bosse latérale obtuse. Elytres finement ponctués, les points sérialement disposés.

Brun foncé. Prosternum, mesosternum, hanches, tarses et base des articles antennaires 2 à 4, brun rouge, couvert de pubescence jaune grisâtre, plus dense sur les élytres exception faire de deux bandes transversales, sur chacun, une prémédiane et une postmédiane et de nombreuses très petites taches circulaires dénudées.

Long.: 5–5 mm. 1/2 ; Larg.: 2–2 mm. 1/4.

Décrit sur des individus de Chine : Province de Kwang-tung et Fokien, à la coll. Gressitt.

Je ne connais cette espèce que d'après la description.

130. ***Exocentrus fasciolatus*** Bates

Exocentrus fasciolatus Bates, 1873, *Ann. Mag. Nat. Hist.* (4) **12** : 384.
Exocentrus curtipennis Pic, 1918, *Mél. exot. ent.* **27** : 10.
Exocentrus fasciolatus Matsushita, 1933, *Journ. Fac. Agr. Hokk.* **34** : 396.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une assez courte épine latérale pointue assez fortement recourbée. Elytres densément et très finement ponctués, les points subalignés.

Rouge foncé, couvert de pubescence jaune paille entremélée sur le disque du pronotum de brun rougeâtre. Elytres parsemés de très petites taches dénudées et ornés chacun d'une large bande transversale postmédiane dénudée qui n'atteint pas la suture et est interrompue par de tres petites taches circulaires jaunâtres. Moitié basilaire des tibias rouge plus clair, leur moitié apicale et les tarses et antennes à pubescence brun foncé, la partie basilaire des articles antennaires à partir du troisième à pubescence gris blanchâtre.

Long.: 5–6 mm.; Larg.: 2–2 mm. 1/2.

Décrit sur des individus du Japon, au Muséum de Paris.—Iles Hokkaido et Hondo (Matsushita). *E. curtipennis* Pic est un synonyme.

131. ***Exocentrus submoerens*** Breuning

Exoceutrns (*Camptomyme*) *submoerens* Breuning, 1958, *Bull. Inst. roy. Sc. nat. Belg.* **34**, No. 22 : 40.

Antennes d'un quart plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une mince épine latéral pointue, dirigée obliquement vers l'arrière et précédée d'une bosse latérale obtuse pas très fortement accusée. Elytres densément et finement ponctués, les points subsérialement disposés.

Rouge clair, couvert d'une pubescence gris clair extrêmement fine. Elytres revêtus de pubescence brun rougeâtre clair et parsemés de petites taches oblongues blanchâtres, rangées en plusieures bandes transversales irrégulières dans la moitie antérieure et en forme d'une bande transversale ondulée au tiers apical. Pattes et antennes jaune rougeâtre.

Long.: 3–3 mm. 3/4 ; Larg.: 1 mm. 1/3–1 mm. 1/2.

Décrit sur un individu de Chine : Hongkong, au British Muséum.—Un Paratype de Chine (*idem*).

132. ***Exocentrus moerens*** Pascoe

Exocentrus moerens Pascoe, 1864, *Trans. ent. Soc. Lond.* (3) **3** : 30.

Antennes aussi longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale pointue fortement recourbée. Elytres densément et peu finement ponctués dans les trois quarts anterieurs, les points sérialement disposés sauf sur le quart sutural.

Rouge, couvert d'une très fine pubescence grise. Elytres parsemés de petite taches oblongues blanches, agglomérées surtout dans la région postbasilaire et dan la région médiane ainsi que dans le quart apical.

Long.: 3 mm. 1/2 ; Larg.: 1 mm.

Décrit sur un individu de la presqu'Ile de Malacce : Singapur, au British Muséum.—Perak (*idem*).

133. ***Exocentrus multiguttulatus*** Pic

Exocentrus multiguttulatus Pic, 1927, *Mél. exot. ent.* **48** : 24.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale pointue, fortement recourbée. Elytres densément et finement ponctués dans les trois quarts antérieurs, les points sérialement disposés sauf sur le quart sutural.

Rouge foncé. Antennes sauf les deux ou trois premiers articles, brun foncé. Elytres rouges, revêtus de pubescence brun rougeâtre foncé et parsemés de nombreuses petites taches blanches, situées en forme de deux bandes : une postbasilaire transversale ondulée et une semicirculaire, partant du bord latéral peu avant le milieu en direction de la suture qu'elle atteint apres le milieu pour revenir à la marge externe peu avant l'apex.

Long.: 4–5 mm.; Larg.: 1 mm. 1/2–1 mm. 2/3.

Décrit sur des individus du Tonkin, à la coll. Pic.—Iles Andamanes (coll. Frey).

134. ***Exocentrus misellus*** Lameere

Exocentrus misellus Lameere, 1893, *Ann. Soc. ent. Fr.* **62** : 285.
Exocentrus coomani Pic, 1925, *Bull. Soc. ent. Fr.* : 138.

Antennes d'un quart plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une courte épine latérale pointue fortement recourbée. Elytres assez densément et peu finement ponctués dans les trois quarts antérieurs, les points sérialement disposés.

Rouge foncé, couvert de pubescence brun rougeâtre. Sur chaque élytre de nombreuses taches quadrangulaires jaune pâle ou jaune blanchâtres, situées en forme de deux larges bandes transversales, une prémédiane s'élargissant latéralement vers l'avant jusqu'à l'épaule et une postmédiane qui n'atteint pas la suture ; ces deux bandes reliées le long de la suture par plusieures taches quadrangulaires jaune pâle. Tiers apical des tibias et les tarses brun foncé.

Long.: 4 mm.; Larg.: 1 mm. 1/3.

Décrit sur un individu de Annam : Hué, au Muséum de Paris.—Tonkin : Hoa-Binh (coll. Pic). *coomani* Pic est un synonyme.

135. ***Exocentrus submisellus*** sp. n.

Proche de *misellus* Lameere, mais l'épine latérale du pronotum précédée d'une bosse latérale obtuse, les élytres moins finement ponctués, non sérialement disposés sur le quart sutural, les taches élytrales sensiblement moins nombreuses et ainsi situées plus éloignées l'une de l'autre.

Long.: 4 mm.; Larg.: 1 mm. 1/3.

Type de Sumatra: Serdang, Tandjong-Morawa, leg. Dr. B. Hagen, au Muséum de Leiden.

136. ***Exocentrus sumatrensis*** Fisher

Exocentrus sumatrensis Fisher, 1927, *Suppl. Ent.* **15** : 83.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois et demie plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une assez longue épine latérale pointue dirigée vers l'arrière. Elytres densément et finement ponctués sur les deux tiers antérieurs, les points peu régulièrement alignés.

Rouge foncé, couvert d'une fine pubescence gris blanchâtre. Elytres revêtus de pubescence brun rougeâtre foncé et ornés de petites taches quadrangulaires blanches, rangées en forme de sept séries longitudinales sur chacun, ces séries de taches interrompues sur l'emplacement d'une bande transversale postmédiane ondulée. Le tiers apical des tibias et les tarses brun noir. La partie basilaire des articles antennaires à partir du troisième à pubescence gris clair.

Long.: 4–4 mm. 1/2 ; Larg.: 1 mm. 1/2–2 mm.

Décrit sur un individu de Sumatra : Medan, au Musée de Washington.—Merang (British Muséum).

137. ***Exocentrus sumatranus*** Breuning

Exocentrus (*Camptomyme*) *sumatranus* Breuning, 1956, *Ann. Mus. civ. Stor. Nat. Genova*, **68** : 249.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale mince et pointue, faiblement recourbée. Elytras densément et finement ponctués, les points, sauf dans le quart sutural, sérialement disposés.

Rouge, couvert d'une pubescence brun rougeâtre. Le bord antérieur et le bord postérieur du pronotum d'un rouge clair. Ecusson à pubescence jaune. Chaque élytre orné de nombreuses petites taches jaunes nettes de forme oblongue, disposées de façon à former une bande prémédiane remontant obliquement de la suture ne direction de l'épaule et une étroite bande postmédiane transversale ondulée, ces deux bandes reliées par trois rangées de petites taches; une autre rangée de taches longe la suture dans le tiers apical, enfin quelques unes de ces taches se trouvent sur le disque avant l'apex. Moitié basilaire des tibias d'un rouge clair. Antennes à pubescence brun rougeâtre foncé.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/2.

Décrit sur un individu de Sumatra : Si-Rambé, au Musée de Gênes.

138. ***Exocentrus costatus*** sp. n.

Antennes comparativement fines, un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois et demie plus large que long, pourvu d'une longue épine latérale pointue, dirigée obliquement vers l'arrière et précédée de deux petites proéminences anguleuses. Elytres densément et assez grossièrement ponctués sur les trois quarts antérieurs, les points, sauf au quart sutural, sérialement disposés, ces séries séparées par des intervalles faiblement convexes.

Brun foncé, la moitié latérale de chaque élytre et tout le quart apical, rouges et couverts d'une éparse pubescence jaune pâle. Ecusson à dense pubescence jaune pâle.

Long.: 5 mm.; Larg.: 1 mm. 1/2.

Type un individu de Sumatra : Deli, au Musée de Leiden.

139. ***Exocentrus cyaneus*** sp. n.

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux deux fois et demie plus longs que les joues. Pronotum fortement transverse, pourvu d'une longue épine latérale mince et pointue, dirigée obliquement vers l'arrière. Elytres très densément et assez grossièrement ponctués, les points assez régulièrement alignés.

Noir, les élytres bleu métallique.

Long.: 4 mm.; Larg.: 1 mm. 1/2.

Type de sur un individu de Sumatra : Palembang, au Musée de Leiden.

140. ***Exocentrus kalshoveni*** Fisher

Exocentrus kalshoveni Fisher, 1934, *Stylops*, **3** : 36, 39.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une assez longue et mince épine latérale pointue, dirigée obliquement vers l'arrière. Elytres densément et peu finement ponctués sur les trois quarts antérieurs, plus ou moins sérialement disposés.

Brun rougeâtre, couvert d'une pubescence jaune blanchâtre. Elytres revêtus de pubescence brune et ornés de bandes longitudinales blanchâtres, plus ou moins confluentes sur la moitié latérale et largement interrompues après le milieu. Antennes brun foncé, le scape et la base des premiers articles suivants à pubescence jaune pâle.

Long.: 5–5 mm. 1/2 ; Larg.: 2–2 mm. 1/4.

Décrit sur des individus de Java : Rembang, au Musée de Washington.

141. ***Exocentrus javaensis*** sp. n.

Antennes d'un quart plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale pointue fortement recourbée. Elytres densément et finement ponctués sur les quatre cinquièmes antérieurs, les points sérialement disposés sauf le quart sutural.

Rouge, les antennes rouge foncé. Ecusson à pubescence jaune pâle. Elytres parsemés de petites taches jaune pâle peu nombreuses, ces taches agglomérées en forme de deux bandes transversales, une postbasilaire remontant obliquement en direction de l'épaule et une médiane fortement ondulée.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/2.

Type de Java : Bantam, iv.1934, leg. J. J. Voet, au Musée de Leiden.

142. ***Exocentrus gedeensis*** sp. n.

Antennes un peu plus longues que le corps, le troisième article à peine moins long que le scape. Lobes inférieurs des yeux plus de trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une longue épine latérale pointue fortement recourbée et précédée d'une bosse latérale obtuse. Elytres peu densément et finement ponctués sur les deux tiers antérieurs, les points régulièrement alignés.

Rouge, revêtu d'une fine pubescence jaunâtre, condensée sur le pronotum pour former une bande longitudinale médiane. Elytres revêtus de pubescence brun rougeâtre, parsemés sur la moitié antérieure de taches oblongues jaunes, rangées sérialement et allant prés de la suture jusqu'au tiers apical, et ornés, chacun, de deux bandes transversales ondulées jaunes, une médiane et une préapicale, cette dernière interrompue par quelques petites taches circulaires dénudées. Antennes à pubescence brun rougeâtre, la base des articles à partir du troisième à pubescence jaunâtre.

Long.: 4 mm.; Larg.: 1 mm. 1/2.

Type de Java : Mt. Gedé, 27.xii.1932, leg. L. G. F. Kalshoven, au Musée de Leiden.

143. ***Exocentrus drescheri*** Fisher

Exocentrus drescheri Fisher, 1934, *Stylops*, **3** : 36, 41.

Antennes aussi longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum faiblement transverse, pourvu d'une petite épine latérale pointue fortement recourbée. Elytres densément et peu finement ponctués dans les trois quarts antérieurs, les points sérialement disposés sauf sur le quart sutural.

Brun foncé, couvert d'une très fine pubescence grise. Elytres revêtus de pubescence brun rougeâtre et ornés de nombreuses étroites taches allongées blanchâtres.

Long.: 3 mm. 3/4–4 mm.; Larg.: 1–1 mm. 1/4.

Décrit sur des individus de Java : Batoerraden, au Musée de Washington.

144. ***Exocentus hirtus*** Fisher

Exocentrus hirtus Fisher, 1925, *Philipp. Journ. Sc.* **28** : 245.

Antennes de moitié plus longues que le corps, le troisième article un peu moins long que le scape. Pronotum deux fois plus large que long, pourvu d'une assez longue épine latérale pointue, dirigée obliquement vers l'arrière. Elytres densément et peu finement ponctués presque jusqu'à l'apex, les points sérialement disposés.

Brun rougeâtre, couvert de pubescence jaune pâle. Elytres revêtus de pubescence brune et parsemés de petites taches jaune pâle rangées en séries longitudinales mais réduites sur l'emplacement d'une tache discale postmédiane. Antennes à pubescence brun rougeâtre la pubescence un peu plus claire sur la base des articles à partir du troisième.

Long.: 5 mm.; Larg.: 2 mm.

Décrit sur un individu de Borneo : Sandakan, au Musée de Washington.

Je ne connais cette espèce que d'après la description.

145. ***Exocentrus subglaber*** Fisher

Exocentrus subglaber Fisher, 1925, *Philipp. Journ. Sc.* **28** : 238.

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Pronotum deux fois plus large que long, pourvu d'une longue épine latérale conique et pointue, dirigée vers l'arrière. Elytres densément et assez grossièrement ponctués sur les trois quarts antérieurs, les points sérialement disposés, moins regulièrement après l'écusson et près du bord latéral.

Noir, couvert d'une très éparse pubescence grise. Elytres revêtus de pubescence brun jaunâtre, le tiers sutural rouge foncé, garni de poils dressés noirs.

Long.: 4 mm. 1/2 ; Larg.: 1 mm. 3/4.

Décrit sur un individu de Borneo : Sandakan, au Musée de Washington.

Je ne connais cette espèce que d'après la description.

146. ***Exocentrus humeralis*** Aurivillius

Xaenapta humeralis Aurivillius, 1922, *Tijdschr. v. Ent.* **65** : 168.

Antennes comparativement fines, un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum plus de deux fois plus large que long, à ponctuation très fine et extrêmement dense, pourvu d'une petite épine latérale pointue et recourbée, rapprochée de la base et de trois très petites proéminences latérales situées toutes entre cette épine et le bord antérieur. Elytres très densément et peu finement ponctués, les points subalignés.

Brun foncé, couvert d'une fine pubescence brun grisâtre. Sur chaque élytre une grande tache humérale qui s'étend presque jusqu'au milieu, mais reste assez distante de la suture et une grande tache apicale qui s'étend plus en avant à la marge externe qu'à la suture, sont rouges et demunies de pubescence. Pattes et antennes à pubescence brun foncé.

Long.: 4 mm.; Larg.: 1 mm. 1/2.

Décrit sur un individu de Nord Palawan Binaluan, au Musée de Leiden.

147. *Exocentrus binaluensis* Breuning

Exocentrus (*Camptomyme*) *binaluensis* Breuning, 1956, *Ark. f. Zool.* (N.S.) **9**, No. 12, : 358.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale conique et pointue, dirigée obliquement vers l'arrière. Elytres densément et peu finement ponctués, les points sérialement disposés dans les trois quarts antérieurs.

Brun foncé. Pronotum rouge. Elytres rouge foncé et ornés de nombreuses très petites taches blanches peu nettes, rangées sur chacun en neuf séries longitudinales.

Long.: 3 mm.; Larg.: 1 mm. 1/3.

Décrit sur un individu de Nord Palawan : Ile Binaluan, au Riksmuseum de de Stockholm.—De nombreux exemplaires au Musée de Leiden.

148. *Exocentrus basilanus* Breuning

Exocentrus (*Camptomyme*) *basilanus* Breuning, 1956, *Ark. f. Zool.* (N.S.) **9**, No. 12 : 358.

Antennes d'un tiers plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une assez longue épine latérale conique et pointue, dirigée obliquement vers l'arrière. Elytres densément et assez finement ponctués sur les deux tiers antérieurs, les points plus ou moins régulièrement disposés en séries longitudinales.

Brun foncé, couvert d'une très éparse pubescence grise. Pronotum rouge, à pubescence rousseâtre. Ecusson à pubescence blanchâtre. Elytres revêtus de pubescence brun foncé et ornés au tiers apical d'une courte et assez large bande transversale ochracée descendant obliquement de la suture en direction de la marge externe, ainsi que d'une bande transversale prémédiane blanchâtre ondulée peu peu apparente.

Long.: 5 mm.; Larg.: 2 mm. 1/2.

Décrit sur un individu des Philippines : Ile Basilan, au Riksmuseum de Stockholm.

149. *Exocentrus angusticollis* Fisher

Exocentrus angusticollis Fisher, 1925, *Philipp. Journ. Sc.* **28** : 248.

Antennes aussi longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale pointue fortement recourbée. Elytres densément et peu finement ponctués dans les trois quarts antérieurs, les points sérialement disposés sauf sur le quart sutural.

Rouge, couvert d'une très fine pubescence grise. Elytres ornés de petites taches gris clair, disposées en forme de deux bandes transversales peu apparentes, une postbasilaire et une juste après le milieu.

Long.: 3 mm. 1/2 ; Larg.: 1 mm. 1/4.

Décrit sur un individu de l'Ile Mindanao : Dapitan, au Musée de Washington.

Je ne connais cette espèce que d'après la description.

150. *Exocentrus philippinensis* nom. nov.

Camptomyme philippinus Fisher, 1925, *Philipp. Journ. Sc.* **28** : 271.

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Lones inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue faiblement recourbée. Elytres densément et finement ponctués, les points sérialement disposés sauf sur le quart sutural.

Tête et pronotum et hanches rouges. Elytres bleu métalliques. Dessous, pattes et antennes noires.

Long.: 3 mm. 1/2–5 mm.; Larg.: 1 mm. 1/4–1 mm. 3/4.

Décrit sur des individus de l'Ile de Luzon sous le nom de *philippinus*. Ce nom étant préoccupé je le change en *philippinensis* : Mt. Banahao, au Musée de Washington.—N. W. Panay (Fisher). C'est l'espèce que Heller à identifié à *callioides* Pascoe.

var. *transeuns* Breuning

Exocentrus (*Camptomyme*) *philippinus* Fisher var. *transeuns* Breuning, 1957, *Ent. NachrBl. österr. u. schweiz. Ent.* **8**, No. 3 : 12.

Comme la forme typique, mais la strie suturale et une large bande longitudinale subsuturale sur chaque élytre sont d'un rouge clair.

Philippines : Pobentoe (coll. Tippmann).

var. *unicolor* Fisher

Camptomyme philippinus var. *unicolor* Fisher, 1925, *Philipp. Journ. Sc.* **28** : 271.

Comme la forme typique, mais les élytres entièrement rouges.

Ile Mindanao : Davao (Fisher).

151. *Exocentrus insularis* (Fisher)

Camptomyme insularis Fisher, 1925, *Philipp. Journ. Sc.* **28** : 273.

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue, faiblement recourbée. Elytres densément et finement ponctués, les points sérialement disposés sauf sur le quart sutural.

Tête, pronotum et écusson brun jaunâtre. Elytres brun noir et ornés de bandes longitudinales grises interrompues par places. Dessous brun noir, jaunâtre le long de la ligne médiane.

Décrit sur un individu de l'Ile Sibuyan au Musée de Washington.

Je ne connais cette espèce que d'après la description.

152. ***Exocentrus callioides*** (Pascoe)

Camptomyme callioides Pascoe, 1864, *Trans. ent. Soc. Lond.* (3) **3** : 44.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale très pointue, dirigée obliquement en arrière. Elytres densément et finement ponctués, les points sérialement disposés sauf sur le quart sutural.

Tête et pronotum rouges. Elytres violet métalliques. Dessous, pattes et antennes noirs à pubescence brun noir.

Long.: 5 mm.; Larg.: 2 mm.

Décrit sur un individu de l'Ile Aru au British Museum.

153. ***Exocentrus bicolor*** (Pascoe)

Camptomyme bicolor Pascoe, 1864, *Trans. ent. Soc. Lond.* (3) **3** : 44, pl. 3, fig. 10.

Proche de *callioides* Pasc., mais les lobes inférieurs aussi longs que les joues, les élytres ponctués plus densément, les points disposés sérialement aussi sur le quart sutural, les élytres noirs.

Long.: 4 mm.; Larg.: 1 mm. 3/4.

Décrit sur un individu de l'Ile Batchian au British Muséum.

154. ***Exocentrus tristis*** (Pascoe)

Camptomyme tristis Pascoe, 1864, *Trans. ent. Soc. Lond.* (3) **3** : 44.

Proche de *callioides* Pascoe, mais plus petit, les lobes inférieurs des yeux aussi longs que les joues, les élytres ponctués plus densément, tout le corps d'une couleur pourpre unicolore et couvert d'une éparse et fine pubescence gris blanchâtre.

Long.: 2 mm. 1/2 ; Larg.: 1 mm. 1/4.

Décrit sur un individu de l'Ile de Batchian au British Muséum.

155. ***Exocentrus miselloides*** Breuning

Exocentrus (*Camptomyme*) *miselloides* Breuning, 1956, *Ann. Mus. civ. Stor. Nat. Genova,* **68** : 250.

Antennes d'un quart plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues.

Pronotum deux fois plus large que long, pourvu d'une assez longue épine latérale pointue fortement recourbée. Elytres peu densément et peu finement ponctués dans les trois quarts antérieurs, les points sérialement disposés.

Rouge foncé, couvert de pubescence brun rougeâtre. Sur chaque élytre de nombreuses taches quadrangulaires jaune pâle situées en forme d'une large bande transversale qui s'élargit latéralement vers l'avant jusqu'à l'épaule et sétendent ensuite sur tout le tiers apical. Tiers apical des tibias et les tarses brun foncé.

Long.: 5 mm.; Larg.: 2 mm.

Décrit sur un individu de Nouvelle Guinée : Ighibirei, au Musée de Gênes.—Queensland : Cairns (British Muséum).

156. ***Exocentrus acutispina*** Fairmaire

Exocentrus acutispina Fairmaire, 1881, *Ann. Soc. ent. Fr.* (6) **1** : 482.
Neosciadella acutispina Dillon & Dillon, 1942, *Bull. Bern. Bish. Mus.*, No. 206, p. 111.
Exocentrus (*Camptomyme*) *acutispina* Fairmaire, Breuning, 1958, *Bull. Inst. roy. Sc. nat. Belg.* **34**, No. 22 : 40.

Antennes d'un quart plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux cinq fois plus longs que les joues. Pronotum très transverse, pourvu d'une épine latérale conique et pointue, fortement recourbée. Elytres très densément et peu finement ponctués sur les deux tiers antérieurs, les points sérialement disposés.

Brun foncé, couvert d'une fine pubescence d'un gris assez foncé. Elytres revêtus de pubescence brun foncé, parsemés sur plus de leur tiers anterieur de petites taches jaunes serrées, rangées en nombreuses séries longitudinales et agglomérées en une bande transversale ondulée située un peu avant le milieu, et parsemés sur le restant de leur surface de très petites taches jaunes rangées, sur chacun, sous forme de quatre séries longitudinales. En plus, sur chaque élytre une large bande transversale préapicale ochracée qui descend obliquement de la suture en direction de la marge externe. Moitié basilaire des articles 3 et 4 et l'extrême base des articles 5 à 10 à pubescence jaune pâle.

Long.: 5–6 mm.; Larg.: 2 mm. 1/3–2 mm. 1/2.

Décrit sur un individu des Iles Fidji au Muséum de Paris (indication erronée).—Répandu par la Nouvelle Guinée, l'Ile Fergusson, Les Thursday Islands et le Queensland (Muséum de Paris, de Leiden etc.).

157. ***Exocentrus ciliatissimus*** Gressitt

Exocentrus ciliatissimus Gressitt, 1956, *Ins. of Micron,,* **17/2** : 156, fig. 25, *b.*

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue assez longue, dirigée presque directement vers l'arrière. Elytres assez densément et finement ponctués, les points sérialement disposés.

Brun rougeâtre, couvert de pubescence gris blanchâtre, éparse au milieu de pronotum et sur les côtés de son disque. Elytres avec des taches brun rougeâtre floues sur la région basilaire et sur la région postmédiane. Moitié apicale des articles antennaires à partir du troisième, à pubescence brun foncé.

Long.: 4 mm. 1/4 ; Larg.: 1 mm. 1/2.

Décrit sur des individus des Iles Palau, Caroline Islands.

3. *EXOCENTRUS* Sousgenre *CENTENEXOCENTRUS* Breuning

Exocentrus Sousgenre *Centenexocentrus* Breuning. 1957, *Bull. Inst. roy. Sci. nat. Belg.* **33**, No. 8 : 17,

Troisième article des antennes un peu moins long que le quatrième, non plus long que le scape. Elytres arrondis à l'apex.

Type : *centenes* Pascoe.

158. *Exocentrus hispidulus* Pascoe

Exocentrus hispidulus Pascoe, 1859, *Trans. ent. Soc. Lond.* (2) **5** : 37 ; 1864, *Trans. ent. Soc. Lond.* (3) **3** : 29.

Antennes un peu plus longues que le corps, le troisième article à peu près aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale pointue, modérément recourbée. Elytres peu densément et finement ponctués jusqu'un peu au delà du milieu, les points sérialement disposés.

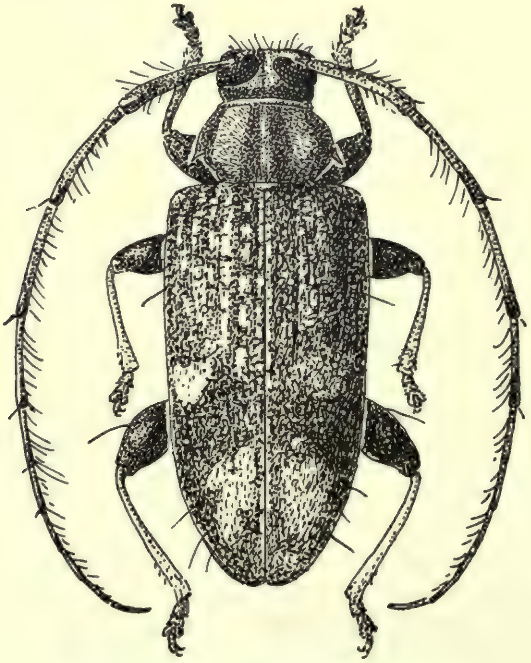

FIG. 3. *Exocentrus hispidulus* Pascoe.

Rouge, couvert de pubescence brun rougeâtre. Disque du pronotum avec deux grandes taches circulaires jaunes et avec une bande longitudinale linéiforme jaunâtre. Ecusson à pubescence jaune. Elytres parsemés de petites taches jaunâtres ou blanchâtres rangées sur chacun en sept séries longitudinales et formant une étroite bande transversole ondulée médiane. Quelquesunes de ces taches sont plus grandes et toujours jaunes: une postbasilaire discale et plusieures sur le quart apical. Scape d'un rouge assez clair. Partie basilaire des articles antennaires 3 à 6 à pubescence jaune grisâtre.

Long. : 5–6 mm. ; Larg. 2–2 mm. 1/2.

Décrit sur un individu des Iles Aru au British Muséum.—Nouvelle Guinée : Dorey (British Muséum) ; Andai, Ighibirei (Musée de Gênes) ; Thursday Island (Muséum de Paris) ; Iles Saylee et Mysol (Pascoe).

159. ***Exocentrus neopomerianus*** Breuning

Exocentrus (*Camptomyme*) *neopomerianus* Breuning, 1957, *Ent. NachrBl. österr. u. schweiz. Ent.* **8** : No. 3 ; 12.

Proche de *hispidulus* Pascoe, mais le troisième article des antennes sensiblement moins long que le scape, le pronotum encore sensiblement plus large, pourvu d'une épine latérale sensiblement plus longue, la tête et le pronotum couverts d'une fine pubescence jaune blanchâtre, le pronotum sans taches jaunes, la partie basilaire des articles antennaires 3 à 10 à pubescence jaune blanchâtre.

Décrit sur un individu de Nouvelle Pomeranie : Mope dans la coll. Tippmann.

160. ***Exocentrus hispiduloides*** Breuning

Exocentrus (*Camptomyme*) *hispiduloides* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 10.

Proche de *hispidulus* Pascoe, mais l'épine latérale du pronotum plus longue, les élytres ponctués jusqu'un peu au delà des trois quarts antérieurs, le pronotum vaguement marbré de jaunâtre, mais sans taches discales jaunes, les taches élytrales un peu plus grandes, moins apparentes et moins nettes.

Décrit sur un individu de Célebès : Makassar au British Muséum.—Pascoe avait confondu cette espèce avec son *hispidulus*.

161. ***Exocentrus seriatopunctatus*** Aurivillius

Exocentrus ? *seriatopunctatus* Aurivillius, 1922, *Tijdschr. v. Ent.* **65** : 167.

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une assez longue épine latérale pointue, dirigée obliquement vers l'arrière. Elytres densément et peu finement ponctués sur les quatre cinquièmes antérieurs, les points sérialement disposés.

Rouge clair. Elytres marbrés de gris, sauf sur l'emplacement d'une large bande postmédiane n'atteignant pas la suture, et parsemés de petites taches brunes. Dessouse parsemé de petites taches glabres. Fémurs légèrement rembrunis. Les articles antennaires à partir du troisième à pubescence un peu plus claire.

Long. : 4 mm. 1/4–5 mm. 3/4 ; Larg. ; 1 mm. 3/4–2 mm. 1/2.

Décrit sur des individus des Iles Key au Riksmuseum de Stockholm et au Musée de Leiden.—Aurivillius cite pour cette espèce aussi l'Ile Binaluan, mais ces exemplaires de cette espèce appartiennent à *mindanaoensis* Fisher.

162. ***Exocentrus mindanaoensis*** Fisher

Exocentrus mindanaoensis Fisher, 1925, *Philipp. Journ. Sc.* **28** : 239.

Très proche de *seriatopunctatus* Aurivillius, amis les lobes inférieurs des yeux seulement deux fois plus longs que les joues, l'épine latérale du pronotum dirigée directement vers l'arrière, la couleur fondamentale du corps d'un brun rougeâtre, celle de la tête noirâtre, le bord antérieur et le bord postérieur du pronotum et la partie apicale des élytres d'une rouge plus clair.

Décrit sur des individus de l'Ile de Mindanao : Davao.—Zamboanga, Iligan (Fisher), au Musée de Washington et de Leiden. ; Kolambugan (coll. Tippmann) ; Ile Binaluan (Aurivillius).

163. ***Exocentrus centenes*** Pascoe

Exocentrus centenes Pascoe, 1864, *Trans. ent. Soc. Lond.* (3) **3** : 29.

Antennes d'un quart plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux fois et demie plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres peu densément et très finement ponctués dans les deux tiers antérieurs, les points régulièrement alignés.

Rouge, couvert d'une très fine pubescence blanchâtre. Elytres parsemés de taches dénudées minimes. Sur chaque élytre une très grande tache postmédiane latérale dénudée qui atteint presque la suture. Tiers apical des tibias à pubescence brun foncé. Antennes à pubescence brun rougeâtre.

Long. : 5 mm. ; Larg. : 2 mm.

Décrit sur des individus de l'Ile de Batjan et de l'Ile de Flores, au British Muséum.

164. ***Exocentrus centenoides*** sp. n.

Proche de *centenes* Pascoe, mais les élytres ponctués presque jusqu'à l'apex, le tiers apical des tibias sans pubescence brun foncé, la base des articles antennaires à partir du troisième à pubescence gris blanchâtre.

Long. : 4 mm. ; Larg. : 1 mm. 2/3.

Type de Sumatra : Ranvas, v.1878, au Musée de Leiden.

165. ***Exocentrus artocarpi*** Fisher

Exocentrus artocarpi Fisher, 1934, *Stylops*, **3** : 36, 40.

Antennes presque de moitié plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois et demie plus longs que les joues. Pronotum faiblement transverse, extrêment finement granulé, pourvu d'une assez longue épine latérale conique pointue, dirigée obliquement vers l'arrière. Elytres peu densément et finement ponctués sur les trois quarts antérieurs, les points sérialement disposés.

Brun rougeâtre foncé couvert de pubescence gris blanchâtre, entremélé de brun sur le pronotum et sur les élytres. Pronotum avec une étroite bande longitudinale médiane blanchâtre. Elytres ornés de nombreuses taches irrégulières blanchâtres qui manquent seulement sur l'emplacement d'une assez grande tache latérale post-médiane.

Long. : 3 mm. 3/4–4 mm. 3/4 ; Larg. : 1 mm. 1/4–1 mm. 2/3.

Décrit sur des individus de Java : Buitenzoorg, au Musée de Washington.—Samarang (Fisher).

166. ***Exocentrus rufobasiantennalis*** Breuning

Exocentrus (*Centenexocentrus*) *rufobasiantennalis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 16.

Antennes un peu moins longues que le corps, le troisième un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale transverse pointue, faiblement recourbée. Elytres densément et finement ponctués, les points subalignés.

Rouge foncé, élytres, pattes et deux premiers articles antennaires rouge clair. Ecusson à pubescence blanchâtre. Elytres revêtus d'une très fine et très éparse pubescence blanchâtre.

Long. : 3 mm. 1/2 ; Larg. : 1 mm.

Décrit sur un individu du Tonkin : Rivière Claire, à l'Institut Royal des Sciences Naturelles de Belgique.

167. ***Exocentrus bicoloripennis*** Breuning

Exocentrus (*Centenexocentrus*) *bicoloripennis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 15.

Antennes d'un quart plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une assez longue épine latérale pointue fortement recourbée. Elytres densément et finement ponctués sur lex deux tiers anterieurs, et parsemés de nombreuses, granules minimes, les points sérialement disposés.

Rouge, couvert d'une fine pubescence brun rougeâtre. Moitié suturale de l'élytre sur les deux tiers antérieurs noire et revêtue d'une fine pubescence gris foncé. Antennes â pubescence brun foncé.

Long. : 4 mm. 1/2–5 mm. ; Larg. : 1 mm. 3/4.

Décrit sur un individu du Tonkin : Cho-ganh, à l'Institut Royal des Sciences Naturelles de Belgique.

4. *EXOCENTRUS* Sousgenre *BARBIEREXOCENTRUS* nov.

Troisième article des antennes beaucoup moins long que le quatrième, un peu plus long que le scape. Elytres arrondis à l'apex, pourvus de points sérialement disposés.

Type *Exocentrus barbieri* Pic.

168. *Exocentrus barbieri* Pic

Exocentrus barbieri Pic, 191, *Dis. Ent.* **9** : 8.

Antennes de moitié plus longues que le corps. Lobes inférieurs des yeux presque deux fois plus longs que les joues. Tête et pronotum à ponctuation extrémement dense et extrêmement fine. Pronotum transverse, pourvu d'une assez petite épine latérale pointue fortement recourbée. Elytres densément et finement ponctués, les points sérialement disposés.

Brun foncé, couvert de fine pubescence grise. Le bord antérieur et le bord postérieur du pronotum, les genoux, les tarses, les deux premiers articles antennaires et la base des articles suivants, rouges. Elytres couverts de pubescence blanchâtre à l'exception d'une tache allongée postscutellaire et de deux bandes transversales assez larges qui n'atteignant pas la suture, une prémédiane et une préapicale, ces taches et bandes brun foncé. Antennes à pubescence d'un brun assez foncé.

Long. : 3–4 mm. ; Larg. : 3/4–1 mm.

Décrit sur des individus de Cochin chine : Saigon, dans la coll. Pic.

5. *EXOCENTRUS* Sousgenre *WOODLARK EXOCENTRUS* Breuning

Exocentrus Sousgenre *Woodlarkexocentrus* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 16.

Troisième article des antennes sensiblement moins long que le quatriéme, sensiblement plus long que le scape. Elytres arrondis à l'apex, pourvus de points disposés sans ordre.

Type : *Exocentrus woodlarkianus* Breuning.

169. *Exocentrus woodlarkianus* Breuning

Exocentrus (*Woodlarkexocentrus*) *woodlarkianus* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 16.

Antennes très fines, cassées chez le type au quatrième article, qui atteint avec son apex le milieu des élytres. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une assez longue épine latérale conique et très pointue, assez fortement recourbés. Elytres densément et très finement ponctués sur les deux tiers antérieurs.

Rouge, couvert d'une fine pubescence jaune paille et garni de longs poils dressés noirs. Elytres parsemés de quelques taches brunes minimes. Sur chaque élytre une grande tache latérale quadrangulaire médiane brun foncé et une tache quadrangulaire préapicale brun foncé plus grande encore qui remonte un peu en direction de la suture. Pattes et scape rouge clair, les rémurs avec un anneau préapical brun.

Long. : 4 mm. 1/2 ; Larg. : 1 mm. 3/4.

Décrit sur un individu de l'Ile de Woodlark à l'Institue Royal des Sciences Naturelles de Belgique.

6. *EXOCENTRUS* SOUSGENRE *PSEUDOCENTRUS* FAIRMAIRE

Pseudocentrus Fairmaire, 1901, *Rev. d'Ent.* **20** : 230.
Exocentrus Sousgenre *Pseudocentrus* Lepesme & Breuning, 1955, *Bull. Soc. ent. France,* **40** : 127.

Troisième article des antennes un peu plus long que le quatrième. Elytres arrondis à l'apex.

Type : *Exocentrus reticulatus* Fairmaire.

170. *Exocentrus sumbawanus* Breuning

Exocentrus (*Pseudocentrus*) *sumbawanus* Breuning, 1957, *Ent. NachrBl. österr. u. schweiz. Ent*· **8**, No. 3 : 13.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale pointue dirigée obliquement vers l'arrière. Elytres densément et très finement ponctués sur les trois quarts antérieurs, les points plus ou moins sérialement disposés.

Brun foncé, couvert d'une pubescence gris jaunâtre. Elytres parsemés de très nombreuses taches jaune pâle sérialement disposées et couvrant la presque totalité de la surface â l'exception d'une large bande transversale postmédiane brun rougeâtre foncé qui n'atteint pas la suture. Antennes à partir du troisième article revêtues saud à la base des articles, d'une pubescence brun foncé.

Décrit sur un individu de l'Ile Sumbawa à la coll. Tippmann.

171. *Exocentrus tectonae* Fisher

Exocentrus tectonae Fisher, 1934, *Stylops,* **3** : 36.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale pointue dirigée vers l'arrière. Elytres assez densément et peu finement ponctués sur les trois quarts antérieurs.

Brun, couvert de pubescence jaune blanchâtre. Elytres revêtus de pubescence brun rougeâtre et parsemés de petites taches jaune blanchâtre floues, rangées en séries et condensées en forme d'une bande transversale médiane ondulée, les taches plus éparses dans la moitié apicale des élytres. Partie basilaire des articles antennaires à partir du troisième à pubescence blanchâtre.

Long. : 4 mm. 1/2–5 mm. 1/2 ; Larg. : 1 mm. 3/4–2 mm. 1/4.

Décrit sur des individus de Java : Samarang et Rembang, au Musée de Washington et de Buitenzorg. D'autres exemplaires au Musée de Leiden.

172. ***Exocentrus actinophorae*** Fisher

Exocentrus actinophorae Fisher, 1934, *Stylops*, **3** : 36, 38.

Antennes d'un quart plus longues que le corps, le troisième article aussi long que le scape. Pronotum deux fois plus large que long, pourvu d'une assez longue épine conique et pointue, dirigée obliquement vers l'arrière et précédée d'une bosse latérale obtuse peu accentuée. Elytres densément et peu finement ponctués sur les trois quarts antérieurs.

Brun foncé, couvert d'une pubescence jaune blanchâtre entremélée de brun clair sur le pronotum. Elytres revêtus de pubescence brune et ornés de taches blanchâtres oblongues floues, taches qui font défaut sur l'emplacement d'une large bande transversale postmédiane. Partie basilaire des articles antennaires à partir du troisième à pubescence gris clair.

Long. : 3 mm. 1/2–5 mm. ; Larg.: 1 mm. 1/2–2 mm. 1/4.

Décrit sur des individus de Java : Sensarang, Madioen et Rembang, au Msuée de Washington et de Buitenzorg.—D'autres exemplaires au Musée de Leiden.

173. ***Exocentrus blötei*** sp. n.

Antennes d'un quart plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux presque quatre fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une assez longue épine latérale pointue fortement recourbée. Elytres très densément et peu finement ponctués sur les quatre cinquièmes antérieurs, les points sérialement disposée.

Brun rougeâtre foncé, couvert de pubescence pareille.

Long.: 5 mm. 1/2; Larg. : 1 mm. 2/3.

Type de N. O. Sumatra : Serdang, Tandjong-Morawa, leg. Dr. B. Hagen, au Musée de Leiden.

174. ***Exocentrus rufohumeralis*** Breuning

Exocentrus (*Pseudocentrus*) *rufohumeralis* Breuning, 1957, *Ent. NachrBl., Wien*, **8**, No. 3 : 13.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une petite épine latérale pointue, dirigée obliquement vers l'arrière. Elytres très densément et peu finement ponctués.

Noir. Elytres d'un bleu foncé métallique. Sur chaque élytre une grande tache humérale et une grande tache apicale, rouge clair. Dessous du corps et pattes à fine pubescence grise.

Long. : 4 mm. ; Larg. : 1 mm. 1/2.

Décrit sur des individus de N.O. Sumatra : Tebing-Tinggi, à la coll. Tippmann.

175. *Exocentrus parterufipennis* Breuning

Exocentrus (*Pseudocentrus*) *parterufipennis* Breuning, 1956, *Ark. f. Zool.* (N.S.) **9**, No. 12 : 358.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale pointue dirigée obliquement vers l'arrière, précédée d'une bosse latérale obtuse. Elytres densément et assez finement ponctués sur les trois quarts antérieurs, les points sérialement disposés.

Noir, couvert d'une fine et éparse pubescence gris foncé ; la moitié latérale de l'élytre, sauf dans la partie médiane est d'un rouge assez clair.

Long. : 4 mm. ; Larg. ; 1 mm. 2/3.

Décrit sur un individu de l'Ile Mindanao : Kolambugan, au Riksmuseum de Stockholm.

176. *Exocentrus mindoroensis* Breuning

Exocentrus (*Pseudocentrus*) *mindoroensis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 12.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum deux fois plus large que long, aplati sur les côtes, pourvu d'une épine latérale pointue fortement recourbée. Elytres peu densément et assez finement ponctués, les points sérialement disposés.

Brun noir. Tête, pronotum et écusson rouge clair. Elytres et antennes couverts de pubescence brun foncé et garnis de poils dressés noirs. Dessous du corps et pattes revêtus de pubescence gris jaunâtre.

Long. : 6 mm. ; Larg. : 2 mm. 1/2.

Décrit sur un individu de l'Ile Mindoro à l'Institut Royal des Sciences Naturelles Belgique.

177. *Exocentrus mindoroanus* Breuning

Exocentrus (*Pseudocentrus*) *mindoroanus* Breuning, 1957, *Ent. NachrBl., Wien*, **8**, No. 3 : 13.

Antennes un peu moins longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une épine latérale triangulaire pointue, dirigée obliquement vers l'arrière. Elytres densément et très finement ponctués, les points sérialement disposés.

Rouge foncé, couvert d'une fine pubescence gris blanchâtre. Elytres revêtus d'une pubescence d'un brun grisâtre foncé et parsemés dans la moitié antérieure ainsi que sur le tiers apical de taches gris blanchâtres floues, rangées, sur chacun, en six séries longitudinales. Antennes à pubescence brun rougeâtre foncé.

Long. : 3 mm. 1/2 ; Larg. : 1 mm. 3/4.

Décrit sur un individu de l'Ile Mindoro : Calapan, à la coll. Tippmann.

178. ***Exocentrus celebicus*** Breuning

Exocentrus (*Pseudocentrus*) *celebicus* Breuning, 1956, *Ann. Mus. civ. Stor. Nat. Genova*, **68** : 249.

Antennes un peu moins longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum deux fois plus large que long, éparsément et extrêmement finement granulé et pourvu d'une petite épine latérale pointue dirigée obliquement vers l'arrière, précédée d'une bosse latérale obtuse. Elytres densément et finement ponctués, les points sérialement quoique peu régulièrement disposés.

Rouge, couvert de pubescence gris blanchâtre. Elytres revêtus de pubescence brun rougeâtre et parsemés dans la moitié antérieure et sur le tiers apical de taches gris blanchâtres peu apparentes rangées, sur chacun, en six séries longitudinales. Antennes à partir du cinquième article revêtues de pubescence d'un brun assez foncé.

Long. : 4 mm. ; Larg. : 2 mm. 1/4.

Décrit sur un individu de Célebès : Kandelari, au Musée de Gênes.

179. ***Exocentrus guttulatus*** Bates

Exocentrus guttulatus Bates, 1873, *Ann. Mag. nat. Hist.* (4) **12** : 385.
Exocentrus guttulatus Matsushita, 1933, *Journ. Fac. Agr. Hokk.* **34** : 396.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux deux fois et demie plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue assez fortement recourbée. Elytres très densément et très finement ponctués sur les quatre cinquièmes antérieurs.

Brun foncé, couvert de pubescence brun foncé. Elytres souvent rouges à pubescence brun rougeâtre, parsemés de nombreuses petites taches jaunes ou gris jaunâtres disposées en séries longitudinales et agglomérées dans la partie apicale ainsi qu'en forme d'une bande médiane transversale peu large. Base des fémurs et des tibias souvent rougeâtre. Antennes souvent rougeâtres, le tiers basilaire des articles antennaires trois et quatre et l'extrême base des articles 5–8 à pubescence blanchâtre.

Long. : 6–7 mm. ; Larg. : 2–2 mm. 1/2.

Décrit par Bates sur un individu du Japon au Muséum de Paris.—Iles Hokkaido, Hondo et Shikoku (Matsushita).

Subspecies ***alboguttatus*** Fisher

Exocentrus alboguttatus Fisher, 1925, *Philipp. Journ. Sc.*, **28** : 240.

Comme la forme typique, mais les taches claires des élytres plus petites et non agglomérées dans la partie apicale des élytres.

Décrit sur des individus de l'Ile Mindanao : Davao au Musée de Washington.—Ile Luzon : Los Banos et Ile Sibuyan (Fisher) ; Ile Basilan (Riksmuseum de Stockholm) ; Iles Palawan (Musée de Leiden).

Subspecies ***subconjunctus*** Gressitt

Exocentrus alboguttatus Fisher subspecies *subconjunctus* Gressitt, 1940, *Philipp. Journ. Sc.* **72** : 184 ; 1951, *Longicornia,* **2**,: 526.

Comme la forme typique, mais les taches claires des élytres un peu plus grandes et partiellement subconfluentes surtout dans la moitié basilaire, mais non agglomérées dans la partie apicale des élytres.

Ile Hainan (Gressitt).

Subspecies ***obscurior*** Pic

Exocentrus guttulatus Bates var. *obscurior* Pic 1929, *Mél. exot. ent.* **53** : 30.

Comme la forme typique, mais les élytes ponctués un peu moins finement, à coloration fondamentale brun foncé, les taches claires plus petites non agglomérées dans la région apicale, la bande transversale médiane plus étroite, plus nette et plus ondulée. Couleur fondamentale des antennes brun noir.

Décrit sur des individus du Tonkin à la coll. Pic.—Hoa-Binh (Muséum de Paris); Bhutan (*idem*).

Var. ***rufescens*** Pic

Exocentrus guttulatus Bates var. *rufescens* Pic, 1929, *Mél. exot. ent.* **53** : 30 ; *Longicornia,* 1951, **2** : 526.

Comme ssp. *obscurior* Pic, mais tout le corps à coloration fondamentale rouge, la pubescence des élytres d'un brun rougeâtre.

Décrit sur un individu de Chine à la coll. Pic.—Tonkin : Hoa-Binh (Muséum de Paris) ; Bhutan (*idem*) ; Iles Andamanes (British Muséum) ; Sumatra : Serdang (Musée de Leiden).

180. ***Exocentrus immaculatus*** Gressitt

Exocentrus immaculatus Gressitt, 1951, *Longicornia,* **2** : 525, 529.

Antennes d'un tiers plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine apicale pointue assez fortement recourbée. Elytres densément et finement ponctués, les points disposés subsérialement.

Brun rougeâtre. Elytres jaune rougeâtre et couverts de pubescence jaune pâle. Sur chaque élytre sept séries longitudinales de très petites taches circulaires dénudées.

Long. : 4 mm. ; Larg. : 1 mm. 2/3.

Décrit sur un individu de l'Ile de Formose : Kuraru, dans la coll. Gressitt.

Je ne connais cette espèce que d'après la description.

181. ***Exocentrus rufithorax*** Gressitt

Exocentrus rufithorax Gressitt, 1935, *Trans. nat. Hist. soc. Formosa*, **25** : 286 ; 1951, *Longicornia*, **2** : 526.

Antennes aussi longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux plus de trois fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une latérale mince et pointue, dirigée vers l'arriére. Elytres assez finement ponctués sur les deux tiers antérieurs et garnis de longs poils dressés.

Noir. Pronotum rouge foncé. Les joues partiellement et les mandibules rougeâtres. Elytres avec des taches brun rougeâtres très peu apparentes et disposés sérialement sur la base et sur le bord latéral.

Long. : 4 mm. 3/4 ; Larg. : 1 mm. 1/2.

Décrit sur un exemplaire de l'Ile de Formose : Piana Ambu, dans la coll. Gressitt.

Je ne connais cette espèce que d'après la description.

182. ***Exocentrus fisheri*** Gressitt

Exocentrus fisheri Gressitt, 1935, *Kontyu*, **9** : 175.

Antennes de moitié plus longues que le corps (♂) ou d'un tiers plus longues (♀), le troisième article un peu moins long que le scape. Pronotum transverse, pourvu d'une longue épine latérale pointue dirigée vers l'arrière. Elytres densément et peu finement ponctués, les points subalignés.

Noir. Elytres d'un brun rouge clair, la moitié suturale sur les deux tiers antérieurs, brun foncé.

Long. : 2–2 mm. 1/4 ; Larg. : 2/3–3/4 mm.

Décrit sur un individu du Japon : Ile Hokkaido, Sapporo dans la coll. Gressitt.

Je ne connais cette espèce que d'après la description.

183. ***Exocentrus saitoi*** Matsushita

Exocentrus saitoi Matsushita, 1935, *Trans. nat. Hist. soc. Formosa*, **25** : 313, fig. 1.
Exocentrus saitoi Gressitt, 1951, *Longicornia*, **2** : 526.

Antennes un peu plus longues que le corps. Pronotum fortement transverse, pourvu d'une assez longue épine latérale fortement recourbée. Elytres densément et extrêmement finement ponctués.

Noir. Elytres bruns. Tête, dessous du corps, pattes et la partie basilaire des articles antennaires à partir du troisième, à fine pubescence grise.

Long. : 8 mm. 1/2 ; Larg. : 3 mm. 1/2.

Décrit sur un exemplaire de Corée : Saigen, dans la coll. Matsushita.

Je ne connais cette espèce que d'après la description.

184. ***Exocentrus dalbergianus*** Gressitt

Exocentrus dalbergianus Gressitt, 1951, *Longicornia*, **2** : 527, 528, pl. 19, fig. 9.

Antennes d'un tiers plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres assez densément et finement ponctués, les points sérialement disposés sauf au quart sutural.

Noir, couvert de pubescence gris blanchâtre. Sur chaque élytre trois bandes transversales noires, une basilaire, une postmédaine et une apicale, la postmédiane n'atteignant pas la suture.

Long. : 6 mm. ; Larg. : 2 mm.

Décrit sur un individu de Chine : Province Hupeh, Lichuan District de l'Académie de Californie.

Je ne connais cette espèce que d'après sa description.

188. ***Exocentrus zikaweiensis*** Savio

Exocentrus zikaweiensis Savio, 1929, *Nat. Ent. chin.* **3** : 3 ; Gressit, 1951, *Longicornia,* **2** : 525.
Exocentrus zikaweiensis Gressit, 1951, *Longicornia,* **2** : 525.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue, fortement recourbée. Elytres densément et finement ponctués.

Noir elytres jaune rougeâtre, revêtus de fine pubescence jaune et garnis de poils dressés noirs.

Long. : 5–8 mm. ; Larg. : 1 mm. 3/4–2 mm. 3/4.

Décrit sur des individus de Chine : Zikawei sur *Gleditschia sinensis.*

Je ne connais cette espèce que d'après la description.

186. ***Exocentrus theresae*** Pic

Exocentrus theresae Pic, 1929, *Echange,* **55**, No. 476 : 4 ; Gressitt, 1951, *Longicornia,* **2** : 526.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale obtuse, fortement recourbée. Elytres très densément et très finement ponctués.

Brun foncé, couvert d'une pubescence d'un brun assez foncé. Le bord antérieur et le bord postérieur du pronotum rougeâtre. Pronotum avec une bande longitudinale linéiforme médiane blanchâtre. Elytres revêtus de pubescence brun rougeâtre foncé et ornés de trois bandes transversales blanches, une prémédiane élargie en direction de la marge externe, une médiane ondulée et une préapicale fortement ondulée. Antennes rougeâtres, à pubescence brun rougeâtre, la base des articles à partir du troisième à pubescence blanchâtre.

Long. : 4 mm. ; Larg. : 1 mm. 2/3.

Décrit sur un individu de Chine : Pékin dans la coll. Pic.

187. ***Exocentrus ruficolor*** Pic

Exocentrus ruficolor Pic, 1944, *Opusc. Mart.* **13** : 13.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue, fortement recourbée. Elytres assez densément et finement ponctués sur les trois quarts antérieurs, les points sérialement disposés.

Rouge, le tiers apical de tibias et les tarses brun foncé.

Long. : 5 mm. ; Larg. : 1 mm. 2/3.

Décrit sur un individu du Tonkin à la coll. Pic.

188. ***Exocentrus nigronotatus*** Pic

Exocentrus nigronotatus Pic, 1926, *Mél. exot. ent.* **45** : 29.

Antennes d'un tiers plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale conique et pointue, assez recourbée. Elytres densément et très finement ponctués sur les trois quarts antérieurs.

Brun foncé, couvert de pubescence gris olive. Elytres parsemés de taches minimes brun foncé rangées en séries longitudinales, d'une grande et large tache transversale postmédiane latérale brun foncé et de nombreuses petites taches brun foncé agglomérées en une sorte de large bande transversale prémédiane. Moitié basilaire des tibias à pubescence blanche. Moitié apicale des tibias, les tarses et les articles antennaires à partir du troisième à pubescence brun foncé. Moitié basilaire du quatrième article des antennes à pubescence blanchâtre.

Long. : 4–7 mm. 1/2 ; Larg. : 2 mm. 1/4–3 mm. 1/2.

Décrit sur des individus du Tonkin : Hoa-Binh, dans la coll. Pic.

189. ***Exocentrus tonkineus*** Pic

Exocentrus tonkineus Pic, 1925, *Mél. exot. ent.* **43** : 131.

Antennes un peu plus longues que le corps, le troisième article sensiblement plus long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale fortement recourbée. Elytres très densément et très finement ponctués dans les trois quarts antérieurs.

Brun, couvert de pubescence jaune paille, entremélée vaguement de brun sur le disque du pronotum. Sur chaque élytre quatre taches étroites et longitudinales brunes sur le tiers basilaire, situées l'une à côté de l'autre, la latérale la plus courte, une tache transversale médiane brune légèrement oblique, remontant en direction de la marge externe, et deux courtes taches longitudinales brunes discales préapicales situées l'une à côté de l'autre. Fémurs bruns à fine pubescence jaunâtre. Tibias et tarses rouge clair à pubescence jaunâtre. Antennes à pubescence brun rougeâtre, la moitié basilaire des articles 3 et 4 à pubescence blanchâtre.

Long. : 7 mm. ; Larg. : 2 mm. 3/4.

Décrit sur un individu du Tonkin à la coll. Pic.

190. ***Exocentrus fouqueti*** Pic

Exocentrus fouqueti Pic, 1932, *Bull. Soc. ent. Fr.* **37** : 156.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum transverse, pourvu d'une petite épine latérale pointue, faiblement recourbée. Elytres densément et très finement ponctués sur les trois quarts antérieurs, les points plus ou moins alignés.

Noir, couvert de pubescence grise. La base du pronotum et l'écusson à pubescence gris blanchâtre. Sur chaque élytre deux étroites bandes blanches, une prémédiane incurvée dans les deux tiers latéraux (à concavité du côte apical)et remontant dans le tiers sutural très obliquement en direction de la suture, et une postmédiane transversale. Antennes à partir du deuxième article à pubescence brun foncé, la base des articles 3 et 4 à pubescence blanchâtre.

Long. : 4–4 mm. 1/2 ; Larg. : 1 mm. 1/2.

Décrit sur un individu du Tonkin : Pho-vi, dans la coll. Pic.

191. *Exocentrus binhensis* Breuning

Exocentrus (*Pseudocentrus*) *binhensis* Breuning, 1957, *Bull. Inst. roy. Soc. nat. Belg.* **33**, No. 8 : 12.

Antennes un peu plus longues que le corps, letroisième article aussi long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum transverse, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et très finement ponctués sur les trois quarts anterieurs.

Brun foncé, couvert d'une fine pubescence grise. Ecusson à pubescence blanche. Elytres revêtus de pubescence brun foncé. Sur chaque élytre trois bandes transversales blanchâtres interrompues par de très petites taches brun foncé, une postbasilaire et une prémédiane réunies dans la moitié suturale, et une préapicale ondulée reliée le long de la suture très étroitement à la bande prémédiane. Antennes à pubescence brun foncé.

Long. : 4 mm. ; Larg. : 1 mm. 2/3.

Décrit sur un individu du Tonkin : Hoa-Binh à l'Institut Royal des Sciences Naturelles de Belgique.

192. *Exocentrus marginicollis* Fisher

Exocentrus marginicollis Fisher, 1932, *Stylops*, **1** : 230.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux quatre foie plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée, précédée d'une bosse latérale obtuse largement rebordée. Elytres très densément et finement ponctués.

Brun rougeâtre foncé. Elytres parsemés de nombreuses petites taches jaune blanchâtre, rangées, sur chacun en forme de six séries lontitudinales.

Long. : 3 mm. 1/2–4 mm. 1/2 ; Larg. : 1 mm. 1/2–1 mm. 3/4.

Décrit sur des individus de la presqu'ile de Malacce : Perak et Tenasserim, au British Muséum.

193. ***Exocentrus andamanensis*** Fisher

Exocentrus andamanensis Fisher, 1932, *Stylops*, **1** : 231.

Proche de *marginicollis* Fisher, mais l'épine latérale du pronotum encore plus recourbée, le bord latéral du pronotum avant cette épine non largement rebordé, les points des élytres subalignés.

Long. : 5 mm. 1/2 ; Larg. : 2–3 mm. 1/2.

Décrit sur des individus des Iles Andamanes, au British Muséum.

194. ***Exocentrus fumosus*** Gahan

Exocentrus fumosus Gahan, 1895, *Ann. Mus. civ. Stor. Nat. Genova*, **34** : 85.

Antennes d'un quart plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une assez longue épine latérale pointue fortement recourbée dirigée en direction de l'épaule. Elytres très densément et peu finement ponctués sur les trois quarts antérieurs.

Brun foncé, couvert de pubescence brun grisâtre foncé. Le bord antérieur et le bord postérieur du pronotum ou tout le pronotum et la moitié basilaire des tibias d'un rouge vif. Ecusson à pubescence jaune. Sur chaque élytre une très étroite bande transversale médiane ondulée jaune et une large bande transversale jaune d'ocre au tiers apical. La partie basilaire du scape et des articles 5 à 7 et les articles 3 et 4 sauf à l'apex, rouges.

Long. : 5 mm. 1/2–7 mm. : Larg. : 1 mm. 3/4–2 mm.

Décrit sur des individus de Tenasserim : Thagata, au Musée de Gènes et au British Muséum.—Tonkin : Hoa-Binh (coll. Frey).

195. ***Exocentrus saleyerianus*** Breuning

Exocentrus (*Pseudocentrus*) *saleyerianus* Breuning, 1957, *Ent. NachrBl., Wien*, **8**, No. 3 : 13.

Proche de *fumosus* Gahan, mais le troisième article des antennes un peu moins long que le scape, les élytres ponctués seulement sur les deux tiers antérieurs, la bande transversale médiane de l'élytre sensiblement plus large, les articles antennaires 3 et 4 rouges seulement dans leur parties basilaires, les articles 5 à 11 à pubescence brun noir.

Long. : 4 mm. 1/2–5 mm. ; Larg. : 1 mm. 2/3–1 mm. 3/4.

Décrit sur des individus de l'Ile Saleyer dans la coll. Tippmann.—D'autres individus de même provenance au Musée de Leiden.

196. ***Exocentrus alboseriatus*** Gahan

Exocentrus alboseriatus Gahan, 1895, *Ann. Mus. civ. Genova*, **34** : 85.
Exocentrus rubripennis Pic, 1929, *Mél. exot. ent.* **53** : 29.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale conique et pointue, fortement recourbée. Elytres très densément et finement ponctués dans les quatre cinquièmes antérieurs.

Noir, couvert d'une fine pubescence grise. Front et tout le dessus du corps d'un rouge brique. Elytres parsemés de très petites taches blanches nettes, rangées sur chacun en sept séries longitudinales. Quart basilaire des articles antennaires 3 à 6 à pubescence blanche.

Long. : 6–7 mm. ; Larg. : 2 mm. 1/3–2 mm. 1/2.

Décrit sur des individus de Tenasserim : Thagata, au Musée de Gênes.—Tonkin (Pic). *E. rubripennis* Pic est un synonyme.

197. ***Exocentrus flemingiae*** Fisher

Exocentrus flemingiae Fisher, 1932, *Ind. For. Rec.* **16** : 296, 297.
Exocentrus rufiscapus Pic, 1939, *VII. Intern. Kongr. f. Ent.* **1**, Sc. Syst. : 344.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum fortement transverse, très densément et extrêmement finement ponctué, pourvu d'une très courte épine latérale pointue fortement recourbée. Elytres densément et assez grossièrement ponctués sur les deux tiers antérieurs, les points subalignés.

Noir luisant. Front, parties latérales du pronotum et dessous du corps couverts d'une fine pubescence gris blanchâtre. Ecusson à pubescence blanche. Sur chaque élytre une très étroite bande transversale médiane blanche et trois très petites taches blanches nettes, une humérale, une discale postbasilaire et une discale préapicale. Pattes et scape jaune rougeâtre ou rouge clair, le tiers apical des tibias, les tarses et les articles antennaires 2 à 11 brun noir, la partie basilaire du troisième article des antennes et le quart basilaire du quatrième, à pubescence blanche.

Long. : 5 mm. 1/2–7 mm. ; Larg. : 2–2 mm. 3/4.

Décrit sur des individus de l'Inde : U.P., Dehra Dun au British Muséum et Musée de Dehra Dun.—Pusa (British Muséum) ; Pedong (Muséum de Paris) ; Tonkin : Pho-ganh (*idem*). *E. rufiscapus* Pic est un synonyme.

var. ***fuscoscapus*** nov.

Comme la forme typique, mais le scape brun foncé.

Type de Sikkim : Pedong, chasseurs indigènes, 1935, ex coll. Oberthür au Muséum de Paris.

198. ***Exocentrus testaceus*** Fisher

Exocentrus testaceus Fisher. 1931, *Ind. For. Rec.* **16** : 297, 322.

Antennes d'un quart plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une assez longue épine latérale pointue fortement recourbée. Elytres densément et peu finement ponctués dans les trois quarts antérieurs, les points sérialement disposés sauf au quart sutural.

Rouge clair. Mesosternum, métasternum, abdomen, pattes et antennes brun foncé, la partie basilaire des articles antennaires 4 à 8 à pubescence blanchâtre.

Long. : 7–8 mm. ; Larg. : 2 mm. 3/4–3 mm.

Décrit sur des individus d'Assam : Cachar, Maflang, au British Muséum et Musée de Washington.

var. ***subbicolor*** nom. nov.

Exocentrus bicolor Pic 1929, *Mél. exot. ent.* **53** : 30.

Comme la forme typique, mais les élytres brun foncé, couverts d'une fine pubescence jaune grisâtre et parsemés de taches minimes dénudées. Partie basilaire des articles antennaires 3 à 10 à pubescence blanchâtre.

Tonkin : Hoa-Binh (coll. Pic.). Le nom *bicolor* étant préoccupé je le change en *subbicolor*.

var. ***diversiceps*** Pic

Exocentrus bicolor var. *diversiceps* Pic, 1931, *Bull. Soc. ent. Fr.*: 259.

Comme var. *subbicolor* Breuning, mais le front et les joues brun noir.

Yunnan (Pic).

var. ***lateraloides*** nom. nov.

Exocentrus bicolor var. *lateralis* Pic, 1936, *Bull. zool. Soc. Fr.* **61** : 299.

Comme var. *subbicolor* Breuning, mais la tête et le pronotum en majeure partie brun foncé, les élytres brun foncé seulement dans la région suturale sauf dans la région apicale.

Tonkin : Hoa-Binh (Pic), décrit sous le nom préoccupé *lateralis* que le change en *lateraloides*.

var. ***rufobasipennis*** Breuning

Exocentrus (*Pseudocentrus*) *testaceus* var. *rufobasipennis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.*, **33**, No. 8 : 13.

Comme var. *subbicolor* Breuning mais le dixieme basilaire des élytres rouge clair, les poils dressés de la partie latérale des élytres, jaunâtres.

Décrit sur un individu de Laos : Vientiane, 8.v.1918, leg. Vitalis de Salvaza à l'Institut Royal des Sciences Naturelles de Belgique.

var. ***rufoampliatus*** nov.

Comme var. *subbicolor* Breuning mais les élytres brun foncé seulement sur les quatre cinquièmes apicaux, les poils dressés de la partie latérale des élytres, jaunâtres.

Type de Bhutan : Marià Basti, leg. L. Durel, ex coll. Oberthür, au Muséum de Paris.

199. ***Exocentrus collarti*** Breuning

Exocentrus (*Bematocentrus*) *collarti* Breuning, 1958, *Bull. Inst. roy. Sc. nat. Belg.* **34**, No. 22.

Antennes d'un tiers plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux sensiblement plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale conique pointue assez fortement recourbée. Elytres densément et peu finement ponctués sur les trois quarts antérieurs, les points serialement disposés.

Brun rougeâtre, couvert de pubescence gris clair. Elytres rouges, revêtus de pubescence jaune blanchâtre et ornés, chacun, de trois taches brun rougeâtre foncé : une grande basilaire, une très grande transversale postmédiane latérale atteignant presque la suture et une grande transversale préapicale. Pattes et antennes à pubescence brun rougeâtre. Moitié basilaire dorsale des tibias à pubescence blanchâtre.

Long. : 6 mm. 1/2 ; Larg. : 2 mm. 3/4.

Décrit sur un individu de Bhutan à l'Institut Royal des Sciences Naturelles de Belgique.

200. ***Exocentrus alni*** Fisher

Exocentrus alni Fisher, 1932, *Ind. For. Rec.* **16** : 296, 298.

Antennes d'un quart plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une longue et très mince épine latérale pointue, fortement recourbée. Elytres densément et finement ponctués sur les quatre cinquièmes antérieurs.

Brun foncé, couvert de pubescence brun foncé. Disque du pronotum densément marbré d'ocharcé. Ecusson à pubescence ochracée. Elytres densément parsemés de petites taches ochracées, agglomérés entre autre pour former trois bandes transversales ondulées, une postbasilaire, une médiane et une préapicale.

Long. : 5 mm. 1/2–8 mm. ; Larg. : 2–3 mm.

Décrit sur des individus de Sikkim : Darjeeling, Lopchu, au British Muséum.

201. ***Exocentrus granulicollis*** Fisher

Exocentrus granulicollis Fisher, 1931, *Ind. For. Rec.* **16** : 297, 323.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue assez fortement recourbée. Elytres très densément et peu finement ponctués, les points obsolètes dans la partie apicale.

Rouge clair. Elytres revêtus d'une fine pubescence gris jaunâtre. Dessous du corps, pattes et antennes brun foncé.

Long. : 5–6 mm. 1/2 ; Larg. : 1 mm. 3/4–2 mm. 1/2.

Décrit sur des individus d'Assam : Shillong, au British Muséum.

202. ***Exocentrus championi*** Fisher

Exocentrus championi Fisher, 1940, *Ind. For. Rec.* (2) **6** : 207.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale pointue, fortement recourbée. Elytres densément et peu finement ponctués.

Rouge, couvert de pubescence brun rougeâtre. Sur chaque élytre cinq séries longitudinales de petites taches jaune blanchâtre, ces taches faisant défaut sur l'emplacement d'une large bande transversale située un peu après le milieu.

Long. : 5 mm. 1/2–6 mm. 1/2 ; Larg. : 2–2 mm. 1/2.

Décrit sur des individus de l'Inde : U.P. Chakrata Range, au British Muséum.

203. ***Exocentrus dalbergiae*** Fisher

Exocentrus dalbergiae Fisher, 1931, *Ind. For. Rec.* **16** : 296, 310.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue, fortement recourbée. Elytres densément et assez grossièrement ponctués sur les trois quarts antérieurs.

Brun foncé. Ecusson à pubescence blanchâtre. Sur chaque élytre trois bandes transversales ondulées blanches, une postbasilaire, une postmédiane et une préapicale. Fémurs et moitié antérieure des tibias à pubescence gris blanchâtre.

Long. : 2 mm. 1/2–5 mm. ; Larg. : 1 mm. 3/4–3 mm.

Décrit sur des individus de l'Inde : U.P. Dehra Dun, au British Muséum.

204. ***Exocentrus trifasciatus*** Fisher

Exocentrus trifasciatus Fisher, 1931, *Ind. For. Rec.* **16** : 296, 307.

Proche de *dalbergiae* Fisher, mais l'épine latérale du pronotum un peu moins longue, les élytres finement ponctués, la base des articles antennaires 4 à 11 à pubescence blanchâtre.

Long. : 3 mm. 3/4 ; Larg. : 1 mm. 1/2.

Décrit sur des individus de l'Inde : Fraserpet, Coorg, au British Muséum et au Musée de Washington.

205. ***Exocentrus cudraniae*** Fisher

Exocentrus cudraniae Fisher, 1931, *Ind. For. Rec.* **16** : 296, 314.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum transverse, pourvu d'une épine latérale mince et pointue, seulement faiblement recourbée. Elytres densément et finement ponctués, les points sérialement rangés sauf au quart sutural.

Brun foncé. Sur chaque élytre trois bandes transversales blanchâtres floues, une prémédiane, une médiane et une postmédiane.

Long. : 3 mm. 1/2–5 mm. 1/2 ; Larg. : 1 mm. 1/4–2 mm.

Décrit sur des individus de l'Inde : U.P. Dehra Dun, au British Muséum et au Musée de Dehra Dun.

206. ***Exocentrus greviae*** Fisher

Exocentrus greviae Fisher, 1931, *Ind. For. Rec.* **16** : 296, 317.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et finement ponctués, les points subalignés.

Rouge, couvert de pubescence brun rougeâtre. Elytres parsemés de petites taches blanches, ranges, sur chacun, en six séries longitudinales, ces taches font défaut sur l'emplacement d'une bande transversale située juste après le milieu. L'extrême base des articles antennaires 4 à 11 à pubescence blanchâtre.

Long. : 4 mm. 1/2–6 mm. 1/2 ; Larg. : 1 mm. 1/2–2 mm. 1/2.

Décrit sur des individus de l'Inde : U.P. Dehra Dun, au British Muséum et au Musée de Dehra Dun.

207. ***Exocentrus seticollis*** Fisher

Exocentrus seticollis Fisher, 1931, *Ind. For. Rec.* **16** : 296, 300.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum fortement transverse, extrêmement finement ponctué, pourvu d'une épine latérale conique et pointue assez recourbée. Elytres densément et peu finement ponctués, les points sérialement disposés.

Brun foncé. Sur chaque élytre une bande transversale postmédiane ondulée blanchâtre assez large. Hanches, moitié basilaire des fémurs et des tibias et les cinq premiers articles antennaires, rouges.

Long. : 5 mm. 1/2 ; Larg. : 2 mm.

Décrit sur des individus de l'Inde : U.P. Dehra Dun, au British Muséum et au Musée de Dehra Dun.

208. ***Exocentrus monticola*** Fisher

Exocentrus monticola Fisher, 1932, *Stylops*, **1** : 228.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum transverse, pourvu d'une épine latéral pointue fortement recourbée. Elytres densément et très finement ponctués sur les trois quarts antérieurs.

Brun foncé, couvert de pubescence brune. Sur chaque élytre quatre larges bandes transversales blanchâtres floues, une basilaire, une prémédiane, une postmédiane et une apicale.

Long. : 5 mm. ; Larg. : 1 mm. 3/4.

Décrit sur un exemplaire de l'Inde : Nilghiri Hills, au British Muséum.

209. *Exocentrus pubescens* Fisher

Exocentrus pubescens Fisher, 1931, *Ind. For. Rec.* **16** : 296, 303.

Antennes un peu plus longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum transverse, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et finement ponctués dans les deux tiers antérieurs.

Rouge foncé. Elytres ornés de taches blanchâtres floues sur le disque de la moitié antérieure et sur le tiers apical. Moitié basilaire des tibias rouge clair.

Long. : 4 mm. 1/4–4 mm. 3/4 ; Larg. : 1 mm. 1/2–1 mm. 3/4.

Décrit sur des individus de l'Inde : N. Salem, Madras, au British Muséum et au Musée de Dehra Dun.

210. *Exocentrus gardneri* Fisher

Exocentrus gardneri Fisher, 1932, *Ind. For. Rec.* **16** : 296, 302.

Proche de *pubescens* Fisher, mais le troisième article des antennes à peine moins long que le scape, les taches blanchâtres des élytres plus étendues ; sur les élytres des taches pareilles aussi entre la moitié antérieure et le tiers apical le long de la suture.

Décrit sur des exemplaires de l'Inde : U.P. Dehra Dun, au British Muséum et au Musée de Dehra Dun.

211. *Exocentrus terminaliae* Fisher

Exocentrus terminaliae Fisher, 1932, *Ind. For Rec.* **16** : 297, 324.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue assez fortement recourbée. Elytres très densément et peu finement ponctués sur les deux tiers antérieurs.

Rouge foncé, unicolore.

Long. : 4 mm. 3/4 ; Larg. : 1 mm. 3/4.

Décrit sur des individus de l'Inde : Bombay, North Tana, Manor Range, au British Muséum et au Musée de Washington.

212. *Exocentrus malloti* Fish.

Exocentrus malloti Fisher, 1931, *Ind. For. Rec.* **16** : 296, 309.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale mince et pointue, faiblement recourbée. Elytres très densément et finement ponctués.

Rouge clair. Sur chaque élytre trois bandes transversales blanchâtres floues et peu apparentes, une postbasilaire, une postmédiane et une préapicale.

Long. : 4 mm. 1/2 ; Larg. : 1 mm. 3/4.

Décrit sur un individu de l'Inde : Bombay, Belgaum, Nagargalli, au British Muséum.

213. ***Exocentrus santali*** Fisher

Exocentrus santali Fisher, 1933, *Ind. For. Rec.* **18/4** : 2.

Proche de *malloti* Fisher, mais l'épine latérale du pronotum un peu plus courte, plus large à la base et plus recourbée et les bandes élytrales plus apparentes.

Long. : 5 mm. 1/4 ; Larg. : 1 mm. 3/4.

Décrit sur des individus de l'Inde : North Salem, Javalagiri au British Muséum et Musée de Washington.—Madras : Sappal, Palghat (Fisher).

213. ***Exocentrus pilosicornis*** Fisher

Exocentrus pilosicornis Fisher, 1932, *Stylops*, **1** : 229.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux de deux tiers plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale assez courte, large à la base et assez fortement recourbée. Elytres très densément et finement ponctués. Les premiers articles antennaires garnis de très longs poils dressés.

Rouge, couvert de pubescence brun rougeâtre. Elytres marbrés de jaune blanchâtre sauf sur quelques assez grandes taches postmédiane brun rougeâtre.

Long. : 4 mm. 1/4 ; Larg. : 1 mm. 3/4.

Décrit sur un individu de l'Inde : Kdai Kanal, au British Muséum.

215. ***Exocentrus subfasciatipennis*** nom. nov.

Exocentrus subfasciatus Pic, 1925, *Mél. exot. ent.* **43** : 131.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale pointue, fortement recourbée. Elytres très densément et finement ponctués.

Brun foncé, couvert d'une fine pubescence gris blanchâtre formant sur la moitié antérieure des élytres de nombreuses bandes longitudinales linéiformes. Sur chaque élytre une bande transversale postmédiane très ondulée d'un brun assez foncé et une petite tache discale préapicale circulaire de même couleur. Les poils dressés du dessus noirs, ceux du bord latéral des élytres et des pattes, blancs. Antennes à pubescence brun foncé.

Long. : 4 mm. ; Larg. : 1 mm. 1/3.

Décrit sur un individu de l'Inde méridionale à la coll. Pic, sous le nom de *subfasciatus*. Ce nom étant préoccupé je le change *subfasciatipennis*.

216. ***Exocentrus indicola*** Fisher

Exocentrus indicola Fisher, 1931, *Ind. For. Rec.* **16** : 297, 321.

Antennes un peu plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue, assez fortement recourbée. Elytres très densément et assez grossièrement ponctués.

Noir, pronotum rouge et couvert d'une fine pubescence dorée.

Long. : 6 mm. 1/4 ; Larg. : 2 mm. 1/2.

Décrit sur des individus de l'Inde : Madras, Sappal, Palghat, au British Muséum et au Musée de Washington.

217. ***Exocentrus kuluensis*** Breuning

Exocentrus kuluensis Breuning, 1957, *Ent. Arb. Mus. Frey*, **8** : 277.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une très courte et très large épine latérale conique recourbée. Elytres très densément et finement ponctués.

Rouge, couvert de pubescence brun rougeâtre. Sur chaque élytre trois bandes transversales blanchâtres floues et peu apparentes, une postbasilaire, une médiane et une préapicale.

Long. : 2 mm. 1/2 ; Larg. : 1 mm. 1/4.

Décrit sur un exemplaire de Kashmir : Kulu, 1200 m. alt., leg. C. Rost dans la coll. Frey.

218. ***Exocentrus reticulatus*** Fairmaire

Exocentrus reticulatus Fairmaire, 1896, *Ann. Soc. ent. Belg.* **40** : 382.
Pseudocentrus lineellus Fairmaire ,1901, *Rev. d'Ent.* **20** : 231.
Exocentrus (*Pseudocentrus*) *reticulatus* Fairmaire, Lepesme & Breuning, 1955, *Bull. Soc. ent. Fr.* **60** : 127.
Exocentrus (*Pseudocentrus*) *reticulatus* Fairmaire & Breuning, 1957, *Fuane de Madag.* **4**: 242, fig. 79,

Antennes un peu plus longues que le corps ; le troisième article un peu plus long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Tête et pronotum à ponctuation très fine et extrêmement dense. Pronotum fortement transverse, pourvu d'une épine latérale pointue, fortement recourbée. Elytres densément et finement ponctués, les points sérialement rangés.

Rouge, la tête, le pronotum, l'écusson, le dessous et les pattes couverts d'une fine pubescence gris clair, le pronotum avec deux taches discales circulaires brunes floues. Elytres revêtus de pubescence brun rougeâtre et ornés de bandes lontigudinales gris clair souvent interrompues et faisant défaut sur l'emplacement d'une assez grande tache transversale postmédiane latérale qui n'atteint pas la suture mais s'élargit en direction de la marge externe. Antennes à pubescence brun rougeâtre.

Long. : 4–6 mm. ; Larg. : 1 mm. 3/4–2 mm.

Décrit sur des individus de Madagascar : Diego Suarez, au Muséum de Paris.— Suberbieville (*idem*). *E. lineellus* Fairmaire est un synonyme.

219. ***Exocentrus subreticulatus*** Breuning

Exocentrus (*Pseudocentrus*) *subreticulatus* Breuning, 1957, *Faune de Madag.* **4** : 242.
Exocentrus reticulatus Aurivillius (nec Fairmaire), 1922, *Ann. Mag. nat. Hist.* (9) **10** : 29.

Proche de *reticulatus* Fairmaire, mais l'épine latérale du pronotum un peu plus courte, les élytres plus finement ponctués et parsemés de granules minimes dénudées, ornés de taches blanchâtres floues rangées en séries longitudinales, mais ne formant pas directement des bandes longitudinales et faisant défaut sur l'emplacement d'une tache postmédiane plus grande.

Décrit sur des individus des Seychelles : Mahé, au British Muséum.

220. ***Exocentrus subexiguus*** Breuning

Exocentrus (*Pseudocentrus*) *subexiguus* Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32**, No. 25 : 17.

Antennes un peu moins longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une petite épine latérale pointue et fortement recourbée, précédée d'une bosse latérale obtuse. Elytres densément et assez grossièrement ponctués sur les deux tiers antérieurs. Entièrement hérissé de longs poils dressés, ces poils noirs sur le dessus, blancs sur le bord latéral des élytres, sur les pattes et sur les antennes.

Brun foncé, couvert d'une fine pubescence gris blanchâtre. Pronotum avec deux vagues bandes longitudinales noirâtres, assez rapprochées de la ligne médiane. Elytres parsemés de très petites taches dénudées et ornés de trois bandes transversales noirâtes peu nettes : une assez large postbasilaire quie remonte en direction de l'écusson, une large postmédiane qui n'atteint pas tout à fait la suture et une étroite préapicale ondulée ; la partie apicale de l'elytre couverte de pubescence jaunâtre. Tibias et antennes rougeâtres, à très fine pubescence blanchâtre.

Long. : 7 mm. ; Larg. : 2 mm. 3/4.

Décrit sur un individu de Somalie : Dagahbur, Ogaden, au British Muséum.

221. ***Exocentrus pseudexiguus*** Breuning

Exocentrus (*Pseudocentrus*) *pseudexiguus* Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32**, No. 25 : 18.

Antennes d'un quart plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale mince et pointue, seulement faiblement recourbée. Elytres densément et très finement ponctués, les points subalignés.

Brun foncé, couvert d'une fine pubescence blanchâtre. Elytres parsemés de taches minimes dénudées et ornés d'une assez large bande transversale postmédiane ondulée brun foncé vague. Pattes à pubescence très éparse. Antennes à pubescence brun foncé.

Long. : 4 mm. 1/2 ; Larg. : 1 mm. 2/3.

Décrit sur un individu de Somalie ; Prov. Mudugh, au British Muséum.—Arfam (*idem*).

222. ***Exocentrus inclusus*** Pascoe

Exocentrus inclusus Pascoe, 1859, *Trans. ent. Soc. Lond.* (2) **5** : 38.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue, modérément recourbée. Elytres densément et très finement ponctués, les points plus ou moins alignés.

Rouge, couvert de pubescence blanchâtre entremélée de brun. Elytres parsemés de très petites taches brun foncé rangées en séries longitudinales, ornés d'une large bande transversale brune fortement ondulée située un peu après le milieu et d'une tache brune discale préapicale qui descend obliquement en direction de la marge externe. Le tiers apical des tibias et les tarses à pubescence brun foncé. Antennes à pubescence brune, la base des articles à partir du troisième à pubescence blanchâtre.

Long. : 4–6 mm. ; Larg. : 1 mm. 1/2–2 mm. 1/4.

Décrit sur un individu de Natal, au British Muséum.—Transvaal, Zululand (Muséum de Paris, coll. Hunt) : South Rhodésie : Sawmills (Musée de Bulawayo).

223. ***Exocentrus lateralis*** Gahan

Exocentrus lateralis Gahan, 1904, *Distant Ins. Transvaal,* 155, pl. **15**, fig. 11.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux plus de deux fois plus long que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale mince dirigée obliquement vers l'arrière. Elytres densément et assez finement ponctués, les points subalignés.

Rouge, couvert d'une très fine pubescence soyeuse grise. Elytres ornés de nombreuses assez grandes taches blanchâtres rangées en séries longitudinales. Sur chaque élytre une étroite bande longitudinale latérale brun foncé s'étendant de la base jusqu'un peu au delà du milieu et couvrant aussi la partie correspondante de l'épipleure, et une assez grande tache quadrangulaire postmédiane subsuturale brun foncé moins nette. Fémurs avec assez large anneau postmédian brun foncé. Moitié apicale des tibias, les tarses et les antennes à pubescence brun foncé, le deuxième article des antennes, la moitié basilaire des articles 3 et 4, et la partie basilaire des articles suivants à pubescence blanche.

Long. : 6 mm. 1/2–8 mm. 1/2 ; Larg. : 2 mm. 1/3–3 mm.

Décrit sur des individus du Transvaal : Lydenburg District, au Musée de Pretoria.

224. ***Exocentrus alternans*** Breuning

Exocentrus (*Pseudocentrus*) *alternans* Breuning, 1956, *Occas. Papers nat. Mus. S. Rhodesia,* No. 21, B : 87.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée Elytres très densément et grossièrement ponctués, les points sérialement disposés, moins régulièrement dans le quart sutural.

Noir. Joues, tempes, pronotum, prosternum, mésosternum et base des tibias d'un rouge assez foncé. Elytres d'un rouge très foncé, couverts d'une fine pubescence grise et ornés, chacun, de douze bandes longitudinales blanches alternantes de façon que les impaires sont plus larges que les paires (linéiformes). Antennes à pubescence noire, la moitié basilaire des articles 3 et 4 et la base des articles 5 à 9 à pubescence blanchâtre.

Long. : 8 mm. ; Larg. : 3 mm.

Décrit sur un individu de South Rhodésie : Khami, au Musée de Bulawayo.

225. ***Exocentrus albovittipennis*** Breuning

Exocentrus (*Pseudocentrus*) *albovittipennis* Breuning, 1956, *Occas. Papers nat. Mus. S. Rhodesia*, No. 21, B, 86.

Antennes d'un quart plus longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale dirigéc droitvers l'arrière. Elytres densément et finement ponctués, les points sérialement disposés.

Noir, couvert de pubescence grise. Sur chaque élytre neuf bandes longitudinales blanches assez larges, seule la huitième très étroite, linéiforme. Tiers basilaire des fémurs rougeâtre. Pattes et antennes noires à pubescence noire, la base des articles antennaires 3 à 9 à pubescence blanchâtre.

Long. : 6 mm. 1/2 ; Larg. : 2 mm. 1/4.

Décrit sur un individu de South Rhodesia : V. Falls Range, au Musée de Bulawayo.

226. ***Exocentrus albovittatus*** Breuning

Exocentrus (*Pseudocentrus*) *albovittatus* Breuning, 1955, *Ark. f. Zool.* (2) 7, No. 29 : 589.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois et demie plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale pointue fortement recourbée, précédée d'uns bosse latérale obtuse. Elytres densément et finement ponctués, le points plus ou moins sérialement disposés.

Rouge foncé, le bord antérieur et le bord postérieur du pronotum rouge clair, couvert de pubescence brun rougeâtre. Elytres parsemés de très petites taches dénudées et ornés, chacun, de huit étroites bandes longitudinales blanchâtres dont les deux latérales sont très étroites, linéiformes. Pattes et antennes revêtus de pubescence brun foncé, l'extrême base des articles antennaires à partir du cinquième à pubescence blanche.

Long. : 8 mm. ; Larg. : 3 mm.

Décrit sur un individu de Rhodésie : Sebakwe, au Riksmuseum de Stockholm.

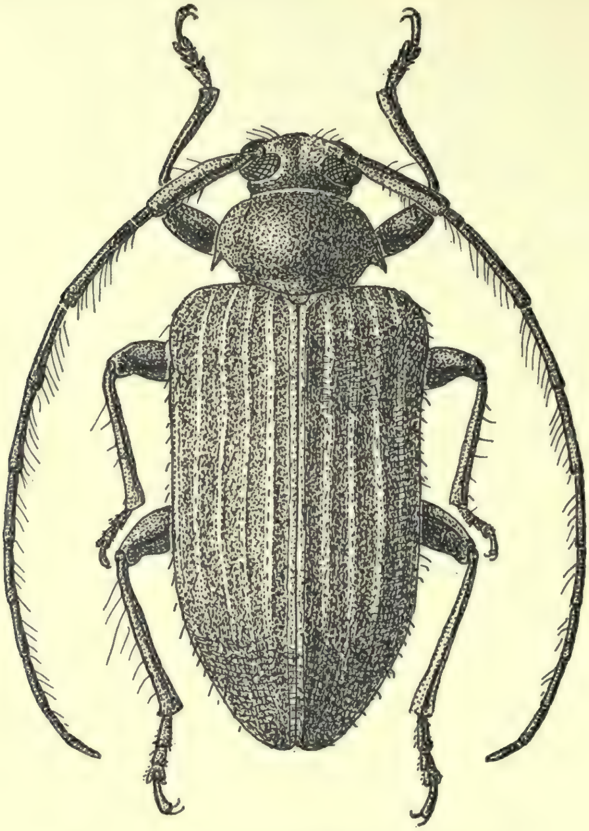

FIG. 4. *Exocentrus albolineatus* Breuning.

227. ***Exocentrus albolineatus*** Breuning

Exocentrus (*Pseudocentrus*) *albolineatus* Breuning, 1955, *Ann. Mus. civ. Stor. Nat. Genova,* **68** : 41.

Antennes un peu plus longues que le corps le troisième article un peu moins long que le scape. Lobes inférieurs des yeux plus de deux fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une petite épine latérale pointue, dirigée obliquement vers l'arrière. Elytres densément et finement ponctués sur les trois quarts antérieurs, les points sérialement disposés.

Rouge foncé, couvert de pubescence brun rougeâtre foncé. Les bords du pronotum souvent d'un rouge plus clair. Sur chaque élytre dix très étroites bandes longitudinales blanches nettes. La partie basilaire des articles antennaires à partir du quatrième à pubescence blanche.

Long. : 5 mm. ; Larg. : 1 mm. 2/3.

Décrit sur un individu de Somalie : Giuba, Belet Amin au Musée de Gênes.— Dagahbur, Ogaden (British Muséum) ; Kenya : Mutha et Tsavo-Voi (*idem*).

228. *Exocentrus multilineatus* Breuning

Exocentrus (*Pseudocentrus*) *multilineatus* Breuning, 1955, *Rev. Fr. d'Ent.* **22** : 123, fig. 3.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum deux fois plus large que long, à ponctuation extrêmement dense et extrêmement fine, pourvu d'une petite épine latérale pointue, fortement recourbée, précédée d'une bosse latérale obtuse. Elytres densément et finement ponctués, les points sérialement disposés.

Rouge, couvert d'une très fine pubescence gris clair. Chaque élytre orné de douze bandes longitudinales linéiformes blanches. Tibias, tarses et antennes noirs ; l'extrême base des articles antennaires 3 à 8 à pubescence blanche.

Long. : 4 mm. 1/2 ; Larg. : 1 mm. 2/3.

Décrit sur un individu du Kenya : Shimoni, au Muséum de Paris.

229. *Exocentrus vittulatus* Aurivillius

Exocentrus vittulatus Aurivillius, 1927, *Ark. f. Zool.* **19A/17** : 20, fig. 176.

Antennes aussi longues que le corps, le troisième article aussi long que le scape. Lobes infèrieurs des yeux sensiblement plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale rapprochée de la base et fortement recourbée. Elytres densément et très finement ponctués, les points plus ou moins sérialement disposés.

Rouge, couvert de pubescence brun rougeâtre. Sur chaque élytre six assez étroites bandes longitudinales blanches nettes dans la moitié antérieures, mais seulement vaguement indiquées par places dans la moitié postérieure. Antennes à pubescence d'un brun assez foncé, le tiers basilaire du scape et la moitié basilaire des articles 3 et 4 rouge clair à fine pubescence jaune blanchâtre.

Long. : 5–6 mm. ; Larg. : 2–2 mm. 1/4.

Décrit sur des individus du Congo belge : Sassa et Haut Uelé Moto, au Musées de Tervueren et de Stockholm.

230. *Exocentrus sublateralis* Breuning

Exocentrus (*Pseudocentrus*) *sublateralis* Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32,** No. 25 : 17.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum presque deux fois plus large que long et pourvu d'une petite épine latérale pointue et fortement recourbée, les côtés du pronotum de cette épine au bord antérieur droits d'abord, rétrécis seulement peu avant le bord antérieur. Elytres densément et finement ponctués, les points assez régulièrement alignés.

Rouge, couvert de pubescence jaune pâle. Sur chaque élytre deux étroites bandes brun foncé, une longitudinale latérale antérieure et une transversale postmédiane fortement ondulée et précédée de pubescence blanche ; la bande longitudinale atteint en arrière la transversale sans toutefois la dépasser. Elytres parsemés en plus de taches minimes dénudées. Pattes presque sans pubescence. La partie basilaire des articles antennaires à partir du troisième à pubescence blanchâtre.

Long. : 6 mm. ; Larg. : 2 mm.

Décrit sur un individu du Kenya : Voi, au British Muséum.

231. *Exocentrus densefuscosticticus* Breuning

Exocentrus (*Pseudocentrus*) *densefuscosticticus* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 14.

Antennes aussi longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une petite épine latérale pointue assez fortement recourbée. Elytres densément et assez finement ponctués, les points subalignés.

Brun foncé, couvert de pubescence gris blanchàtre. Pronotum et élytres parsemés de nombreuses très petites taches dénudées. Sur chaque élytre une courte bande longitudinale latérale subhumérale noirâtre et une assez étroite bande transversale postmédiane ondulée noirâtre descendant dans la moitié suturale en direction de la suture. Le tiers apical des tibias, les tarses et les antennes â pubescence noire, la moitié basilaire des articles antennaires 3 et 4 et la base des articles 5 à 11 à pubescence blanche.

Long. : 5 mm. ; Larg. : 2 mm.

Décrit sur un individu du Kenya : Tana River, Garissa Bura, au British Muséum.

232. *Exocentrus tippmanni* Breuning

Exocentrus (*Pseudocentrus*) *tippmanni* Breuning, 1957, *Ent. NachrBl., Wien,* **8**, No. 3 : 12.

Antennes d'un quart plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une assez longue et mince épine latérale pointue dirigée directement vers l'arrière. Elytres très densément et finement ponctués.

Rouge foncé, couvert de pubescence brun rougeâtre foncé. Le bord antérieur et le bord postérieur du pronotum, la suture et les épipleures des élytres, les genoux et la moitié basilaire des fémurs, rouge clair. Elytres parsemés de très petites taches ochracées disposées en forme de deux bandes transversales, une postbasilaire et une postmédiane. La partie basilaire des articles antennaires à partir du troisième, rouge clair à pubescence blanchâtre.

Long. : 8 mm. ; Larg. : 3 mm.

Décrit sur des individus du Tanganyika, à la coll. Tippmann.

233. *Exocentrus mirei* Lepesme & Breuning

Exocentrus mirei Lepesme & Breuning, 1955, *Bull. de l'I.F.A.N.* **17**, A, No. 3 : 855.

Antennes comparativement assez fines, un peu moins longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux plus de trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale peu longue, mince et pointue assez faiblement recourbée. Elytres très densément et peu finement ponctués, les points assez régulièrement alignés.

Brun foncé, revêtu de pubescence brun foncé. Elytres d'un brun rougeâtre clair et couverts d'une éparse pubescence jaunâtre entremélée d'un peu de gris clair. La partie basilaire des articles antennaires à partir du deuxième couverte de pubescence gris blanchâtre.

Long. : 7 mm. ; Larg. : 2 mm. 3/4.

Décrit sur des individus de la région saharienne : Ouaddai, Ouadi près Gouro, au Muséum de Paris.

234. *Exocentrus crassepunctus* Lepesme & Breuning

Exocentrus crassepunctus Lepesme & Breuning, 1955, *Bull. de l'I.F.A.N.* **17,** A, No. 3 : 855.

Proche de *mirei* Lepesme & Breuning, mais l'épine latérale du pronotum très fortement recourbée, les élytres sensiblement plus grossièrement ponctués, les points encore plus régulièrement alignés, les élytres partiellement d'un brun assez foncé et marbrés de blanc d'une façon floue.

Long. : 6 mm. ; Larg. : 2 mm. 2/3.

Décrit sur un individu de la région saharienne : Air-Bir Douané, au Muséum de Paris.

235. *Exocentrus subgrisescens* Breuning

Exocentrus (*Pseudocentrus*) *subgrisescens* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 133

Antennes un peu plus longues que la corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux trois fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue, dirigée vers l'arrière. Elytres densément et peu finement ponctués sur les trois quarts antérieurs, les points subsérialement disposés.

Brun foncé, couvert de pubescence gris foncé et vaguement marbrés de gris blanchâtre et de brun. Sur chaque élytre une assez grande tache postmédiane suturale brune, bordée en avant d'une pubescence plutôt blanchâtre. Partie basilaire des articles antennaires 3 à 11 à pubescence gris clair.

Long. : 5 mm. 1/2 ; Larg. : 2 mm. 1/2.

Décrit sur un individu du Congo belge : Mayidi, ay Musée de Tervueren.

236. *Exocentrus ghesquierei* Breuning

Exocentrus (*Pseudocentrus*) *ghesquierei* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 134.

Antennes aussi longues que le corps, le troisième article un peu moins long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale pointue, dirigée vers l'arrière. Elytres densément et très finement ponctués sur les quatre cinquièmes antérieurs.

Brun foncé, couvert d'une fine pubescence gris blanchâtre. Vertex et disque du pronotum densément marbrés de jaune d'ocre. Elytres revêtus de pubescence brun foncé, parsemés dans les deux tiers antérieurs sur la moitié suturale de nombreuses petites taches blanchâtres et densément marbrés de jaune d'ocre sur le restant de leur surface à l'exception d'une vague bande transversale postmédiane ondulée. Pattes et antennes couvertes de pubescence brun foncé ; fémurs marbrés de jaune d'ocre. Moitié basilaire des tibias rouge. Partie basilaire des articles antennaires 3 à 11 à pubescence blanchâtre.

Long.: 5 mm. 1/2 ; Larg.: 2 mm.

Décrit sur un individu du Congo belge : Sankuru, Lodja, au Musée de Tervueren.

237. ***Exocentrus obliquevittatus*** Breuning

Exocentrus (*Pseudocentrus*) *obliquevittatus* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 14.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une epine latérale pointue fortement recourbée. Elytres densément et finement ponctués sur les trois quarts antérieurs, les points subalignés.

Brun foncé, couvert de pubescence jaune paille olivâtre. Sur chaque élytre une étroite bande transversale médiane d'un brun assez foncé faiblement ondulée dans la moitié latérale et se dirigeant obliquement vers l'arrière en direction de la suture dans la moitié suturale. Le tiers apical des tibias, les tarses et les antennes revêtus de pubescence brun foncé, la base des articles antennaires 4 à 10 à pubescence grise.

Long.: 5–6 mm.; Larg.: 2–2 mm. 1/2.

Décrit sur des individus du Congo belge : Lukolela, à l'Institut Royal des Sciences Naturelles de Belgique.

238. ***Exocentrus ochreovitticollis*** Breuning

Exocentrus (*Pseudocentrus*) *ochreovitticollis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 13.

Antennes cassées au scape chez l'unique exemplaire connu. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres assez densément et très finement ponctués sur les deux tiers antérieurs.

Rouge, couvert d'une fine pubescence brun rougeâtre clair. Pronotum avec deux larges bandes longitudinales discales ochracées. Elytres parsemés de très nombreuses très petites taches blanches, rangées, sur chacun, en à peu près 15 séries longitudinales, celles du tiers sutural à peine perceptibles. Pattes jaune rougeâtre, la moitié apicale des fémurs sauf à l'apex, le quart apical des tibias et les tarses, noirs. Scape noir, rouge clair sur le quart basilaire.

Long.: 8 mm.; Larg.: 3 mm. 1/2.

Décrit sur un individu du Cameoun : Ja River, à l'Institut Royal des Sciences Naturelles de Belgique.

239. ***Exocentrus ivorensis*** Breuning

Exocentrus (*Pseudocentrus*) *ivorensis* Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32**, No. 25 : 16.

Antennes aussi longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Tête et pronotum assez densément et très finement ponctués. Pronotum deux fois plus large que long, pourvu d'une épine latérale conique pointue recourbée. Elytres densément et très finement ponctués, les points subalignés sur la moitié latérale.

Rouge, couvert de pubescence jaune blanchâtre. Pronotum avec deux bandes longitudinales brun rougeâtre, rapprochées de la ligne médiane. Elytres ornés d'une tache triangulaire postscutellaire brun rougeâtre et ornés, chacun, de bandes brun rougeâtre : une courte bande longitudinale latérale prémédiane et une assez large bande transversale postmédiane, formant avec celle de l'élytre opposé un grand *M*. Antennes à pubescence brun rougeâtre, l'extrême base des articles 3 à 11 à pubescence jaune pâle.

Long.: 5 mm. 1/2 ; Larg.: 2 mm.

Décrit sur un individu de Côte d'Ivoire : Dimbokro, à l'Institut Royal des Sciences Naturelles de Belgique.

240. ***Exocentrus senegalensis*** sp. n.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum presque deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres très densément et finement ponctués presque jusqu'à l'apex.

Brun foncé, couvert de pubescence jaune paille. Vertex avec deux bandes longitudinales noirâtres. Disque du pronotum avec quatre bandes longitudinales noirâtres. Elytres parsemés de nombreuses petites taches circulaires brun noir et ornés, chacun, d'une grande tache basilaire noirâtre basilaire à côté de l'ecusson et d'une bande transversale noirâtre peu large, située juste après le milieu. Bord antérieur et postérieur du pronotum et région humérale des élytres à couleur fondamentale rouge. Pattes et antennes rouges. La partie préapicale des fémurs, le tiers apical des tibias, les tarses, le scape, la partie apicale du deuxième article des antennes, la moitié apicale des articles 3 à 5, les articles 6 à 10 sauf à la base et tout l'article onze noirs.

Long.: 6 mm.; Larg.: 2 mm. 1/2.

Type du Sénégal dans la coll. Frey.

7. ***EXOCENTRUS*** Sousgenre ***OLIGOPSIS*** Thomson

Oligopsis Thomson, 1864, *Syst. Cer.*: 111.
Oligopsis Lacordaire, 1872, *Gen. Col.* **9** : 806.
Ispaterus Fairmaire, 1892, *Rev. d'Ent.* **11** : 122.
Exocentrus Sg. *Oligopsis* Lepesme & Breuning, 1955, *Bull. Soc. ent. Fr.* **60** : 127.

Troisième article beaucoup plus long que le quatrième. Elytres arrondis à l'apex, pourvus de points sérialement disposés.

Type : *exocentroides* Thomson. *Ispaterus* Fairmaire est un synonyme.

241. ***Exocentrus meridionalis*** Hunt & Breuning

Exocentrus (*Oligopsis*) *meridionalis* Hunt & Breuning, 1957, *Durban Mus. Novit.* **5**:62.

Antennes un peu moins longues que le corps. Le troisième article aussi long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une épine latérale pointue assez faiblement recourbée. Elytres densément et assez grossièrement ponctués, les points sérialement disposés.

Rouge foncé, couvert d'une pubescence jaunâtre entremélée de brun rougeâtre. Ecusson avec une bande longitudinale médiane brun foncé. Elytres revêtus de pubescence jaune paille et ornés, chacun, d'une grande tache circulaire discale basilaire brun foncé, d'une tache brune subhumérale, d'une bande transversale postmédiane brun foncé incurvée (à convexité du côté apical) et d'une étroite bande transversale brune préapicale fortement sinuée et peu apparente. Fémurs rembrunis partiellement. Le scape, le quart apical des articles antennaires 3 et 4, la moitié apicale des articles 5 à 8 et tous les quatre derniers articles brun foncé.

Long.: 6 mm.; Larg.: 2 mm.

Décrit sur un individu de Zululand : Eteza (leg. Hunt), dans la coll. Hunt.

242. ***Exocentrus sexseriatus*** Aurivillius

Exocentrus sexseriatus Aurivillius, 1908, *Ent. Tidskr.* **29** : 129.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux plus de deux fois plus longs que les joues. Pronotum à peine deux fois plus large que long, pourvu d'une épine latérale pointue, fortement recourbée. Elytres densément et assex finement ponctués, les points régulièrement alignés.

Rouge, couvert de pubescence brun rougeâtre. Front et dessous à fine pubescence gris clair. Sur chaque élytre huit bandes longitudinales blanches parcourant la moitié antérieure et huit autres courtes bandes pareilles formant une sorte de large bande transversale postmédiane. La partie basilaire des articles antennaires à partir du troisième à pubescence blanche.

Long.: 6 mm. 1/2 ; Larg.: 2 mm. 1/2.

Décrit sur un individu de Zululand, au Musée de Stockholm.—Kenya : Mombasa (British Muséum).

243. ***Exocentrus betschuanus*** sp. n.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et assez grossièrement ponctués, les points sérialement disposés.

Rouge foncé. Front, dessous du corps et fémurs revêtus d'une fine pubescence grise. Disque du pronotum et élytres très densément marbrés de jaune paille. Elytres parsemés de très petites taches brunes rangées en séries longitudinales et ornés, chacun, d'une assez grande tache brune postmédiane latérale. Tibias rouge clair. Tarses à pubescence brun foncé. Antennes à pubescence brun foncé, le deuxième article, les deux tiers basilaires des articles 3 et 4, rouge clair. La base des articles 5 à 11 à pubescence jaune blanchâtre.

Long.: 6 mm.; Larg.: 2 mm. 1/4.

Type de Betschuanaland : Gaberones, leg. R. Ellenberger, au Muséum de Paris.

244. ***Exocentrus major*** Breuning

Exocentrus (*Oligopsis*) *major* Breuning, 1956, *Occas. Papers nat. Mus. S. Rhodesia*, No. 21, B : 87.

Antennes un peu moins longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu sur les côtés du disque de quelques points fins et d'une longue épine latérale mince pas très fortement recourbée et tronquée à l'apex. Elytres densément et grossièrement ponctués, les points sérialement disposés, moins régulièrement au quart sutural.

Brun foncé, couvert d'une fine pubescence gris blanchâtre. Elytres parsemés de nombreuses petites taches circulaires brun foncé et ornés d'une bande transversale peu large et fortement ondulée, brun foncé située un peu après le milieu. La partie antérieure du disque du pronotum, les fémurs en partie, les tibias et les articles antennaires 2 à 4, rouges. Les antennes revêtues de pubescence brun foncé, la base des articles 5 à 10 à pubescence blanchâtre.

Long.: 8 mm.; Larg.: 3 mm. 1/2.

Décrit sur un individu de South Rhodesia : Khami, au Musée de Bulawayo.

245. ***Exocentrus viridipennis*** Breuning

Exocentrus (*Oligopsis*) *viridipennis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 14.

Antennes cassées au cinquième article chez l'unique exemplaire connu, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Tête et pronotum très densément et très finement ponctués. Pronotum presque deux fois plus large que long, pourvu d'une épine latérale pointue très mince, dirigée obliquement vers l'arrière. Elytres très densément et grossièrement ponctués jusque juste avant l'apex, les points disposées en séries longitudinales régulières.

Noir ; la tête en grande partie rouge. Elytres d'un vert métallique, couverts d'une pubescence blanchâtre extrêmement fine et garnis de longs poils dressés blanchâtres. Les hanches, la moitié basilaire des fémurs et le quart basilaire des tibias, rouges. Moitié basilaire des articles antennaires 3 et 4 et tiers basilaire du cinquième article à pubescence blanchâtre.

Long.: 8 mm.; Larg.: 3 mm. 1/2.

Décrit sur un individu du Congo belge : Kwango, Ngowa à l'Institut Royal des Sciences Naturelles de Belgique.

246. ***Exocentrus unicoloripennis*** nom. nov.

Exocentrus (*Ispateus*) *unicolor* Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32**, No. 25 : 19.

Antennes aussi longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux sensiblement plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une petite épine latérale pointue, fortement recourbée, précédée d'une bosse latérale obtuse. Elytres très densément et finement ponctués, les points sérialement disposés.

Brun foncé, couvert de pubescence jaune grisâtre ; les genoux, le deuxième article des antennes, la moitié basilaire des articles 3 à 6 et la partie basilaire des articles 7 à 11, rouges.

Long.: 4 mm.; Larg.: 1 mm. 2/3.

Décrit sur un individu du Kenya : Ziwani, au British Muséum sous le nom *d'unicolor*. Ce nom étant préoccupé je le change en *unicoloripennis*.

247. ***Exocentrus nigroplagiatus*** Breuning

Exocentrus (*Ispateus*) *nigroplagiatus* Breuning, 1956, *Bull. Inst. roy. Sc. nat. Belg.* **32**, No. 25 : 18.

Antennes un peu moins longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum plus de deux fois plus large que long, pourvu d'une petite épine latérale pointue, fortement recourbée, précédée d'une bosse latérale obtuse. Elytres densèment et grossièrement ponctués, les points régulièrement alignés.

Noir, couvert de pubescence blanchâtre. Pronotum orné de quatre grandes taches noires en oval allongé, les internes se joignant presque, chacune des latérales embrassant l'épine latérale. Sur chaque élytre quatre grandes taches circulaires noires : deux basilaires (une discale et une humérale) et deux médianes (une discale et une latérale) ainsi qu'une étroite bande transversale préapicale ondulée noirâtre peu nette. Le sixième apical de l'élytre couvert de pubescence ochracée. Moitié basilaire des tibias rouge clair, moitié apicale des tibias et les tarses à pubescence noire. La partie apicale du scape et les articles antennaires 3 et 4, la moitié apicale du cinquième article et les articles 6 à 11, sauf la partie basilaire du sixième sont revêtus de pubescence noire.

Long.: 6 mm.; Larg.: 2 mm. 3/4.

Décrit sur un individu du Kenya : Bura, Garissa, au British Muséum.

248. ***Exocentrus patrizii*** Breuning

Exocentrus (*Ispaterus*) *patrizii* Breuning, 1955, *Ann. Mus. civ. Stor. Nat. Genova,* **48** : 41.

Antennes aussi longues que le corps, le troisième articles un peu plus long que le scape. Lobes inférieurs des yeux plus de deux fois plus longs que les joues. Pronotum presque deux fois et demie plus large que long, très densément et très finement ponctué, pourvu d'une petite épine latérale pointue fortement recourbée. Elytres densément et assez grossièrement ponctués, les points assez régulièrement alignés.

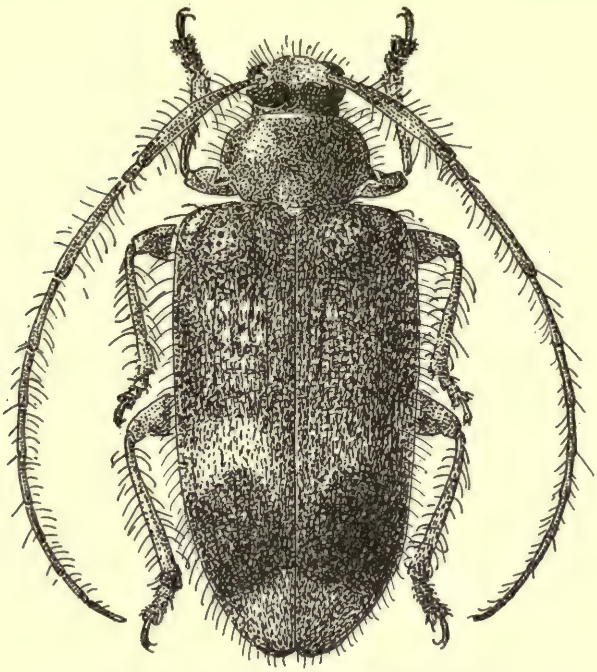

FIG. 5. *Exocentrus patrizii* Breuning.

Brun foncé, couvert de pubescence brun foncé. les élytres ornés dans la moitié antérieure et dans le quart apical de petites taches jaune blanchâtre serrées, sérialement disposées et condensées sous forme d'une bande transversale médiane ondulée. Pettes et premiers articles antennaires rouges. Les articles antennaires à partir du cinquième couverts de pubescence gris clair dans le tiers basilaire et de pubescence brun foncé dans les deux tiers apicaux.

Long.: 5 mm.; Larg.: 2 mm. 2/3.

Décrit sur un individu de Somalie : Oiana di Fungalango, au Musée de Gênes.—Abyssinie : God Adda (British Muséum) ; Villagio Duca di Abruzzi (Musée de Stockholm).

249. **Exocentrus longipilis** (Fairmaire)

Ispateus longipilis Fairmaire, 1892, *Rev. d'Ent.* **11** : 123.

Antennes aussi longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux plus de deux fois plus longs que les joues. Pronotum plus de deux fois plus large que long, densément et très finement ponctué, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et peu finement ponctués, les points régulièrement alignés.

Brun foncé, couvert de pubescence gris blanchâtre. Pronotum avec quatre bandes longitudinales vagues brunes, les deux internes rapprochées de la ligne médiane, chacune des latérales située contre l'épine latérale. Elytres parsemés de très petites taches dénudées rangées en séries longitudinales et ornés, chacun, d'une assez courte bande transversale médiane brun foncé formant un grand *M*. La moitié basilaire des tibias rougeâtre. Les articles antennaires 3 et 4 sauf à l'apex, ainsi que le partie basilaire des articles suivants, rouges et couverts de fine pubescence blanchâtre.

Long.: 5 mm. 1/2–6 mm.; Larg.: 2 mm. 1/3–2 mm. 2/3.

Décrit sur un individu d'Obock à l'Institut Royal des Sciences Naturelles de Belgique.—Djibouti (Muséum de Paris) ; Somalie : Dolo, Oddur (Musée de Gênes) ; Abyssinie : Gallococo (Musée de Gênes) ; Diré Daua, Harrar (British Muséum) ; Kenya : Mayudi (British Muséum) ; Taweta (Muséum de Paris) ; Tanganyika : Mt. Meru (Musée de Stockholm).

250. ***Exocentrus exocentroides*** Thomson

Oligopsis exocentroides Thomson, 1864, *Syst. Cer.* : 111.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et très finement ponctués sur les deux tiers antérieurs, les points sérialement disposés sauf sur le quart sutural.

Brun foncé, couvert de pubescence brun rougeâtre. Elytres ornés de nombreuses petites taches jaunâtres rangées en séries longitudinales, agglomérées en une étroite bande transversale médiane ondulée et faisant défaut sur l'emplacement d'une bande transversale postmédiane ondulée assez large. L'extrême base des articles antennaires 3 à 10 à pubescence jaune pâle.

Long.: 5 mm. 1/2 ; Larg.: 2 mm.

Décrit sur un individu de l'Ile Ceylan : Colombo, au Muséum de Paris.

251. ***Exocentrus albizziae*** Fisher

Exocentrus albizziae Fisher, 1932, *Ind. For. Rec.* **16** : 296, 319.

Antennes d'un quart plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et finement ponctués sur les deux tiers antérieurs, les points sérialement disposés sauf sur le quart sutural.

Rouge foncé, couvert de pubescence jaune paille. Elytres revêtus de pubescence brun rougeâtre et parsemés de nombreuses petites taches jaunes disposées en séries longitudinales, mais faisant presque défaut sur l'emplacement d'une bande transversale postmédiane qui remonte obliquement en direction de la marge externe, et agglomérées en une étroite bande transversale médiane qui remonte obliquement en direction de la marge externe.

Long.: 4 mm. 1/2–7 mm. 1/2 ; Larg.: 1 mm. 3/4–3 mm.

Décrit sur des individus de l'Inde : Madras, Sappal, Palghat, au British Muséum et au Musée de Dehra Dun.—Nilghiri Hills (British Muséum).

251. ***Exocentrus (Oligopsis) roonwali*** sp. n.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une petite épine latérale pointue, assez fortement recourbée. Elytres densément et finement ponctués sur les deux tiers antérieurs, les points sérialement disposés.

Brun foncé, couvert de pubescence gris clair entremélée de brun sur le disque du pronotum. Elytres revêtus de pubescence brun foncé et ornés dans la moitié antérieure et dans le quart apical de très nombreuses petites taches blanchâtres, rangées sérialement et confluents en partie. Ces taches font défaut sur une large bande transversale postmédiane exception faite d'une série le long de la suture. Pattes et antennes à pubescence brun foncé, la base des articles antennaires 3 à 11 à pubescence gris blanc.

Long.: 4 mm.; Larg.: 1 mm. 3/4.

Type un individu de l'Inde: Orissa, Angul, Purnakot Range, au Musée de Dehra Dun.

253. ***Exocentrus annamensis*** Breuning

Exocentrus (*Oligopsis*) *annamensis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 15.

Antennes aussi longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux deux fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et finement ponctués sur les trois quarts antérieurs, les points sérialement disposés.

Noir, couvert de pubescence brun foncé. Sur chaque élytre deux bandes transversales blanchâtres floues et peu apparentes, une postbasilaire et une médiane.

Long.: 5 mm.; Larg.: 2 mm.

Décrit sur un individu d'Annam : Muong-sen, sur le Nam-mo, à l'Institut Royal des Sciences Naturelles de Belgique.

254. ***Exocentrus timorensis*** Breuning

Exocentrus (*Oligopsis*) *timorensis* Breuning, 1957, *Bull. Inst. roy. Sc. nat. Belg.* **33**, No. 8 : 14.

Antennes d'un quart plus longues que le corps ; le troisième article un peu plus long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum deux fois plus large que long, pourvu d'une épine latérale pointue fortement recourbée. Elytres densément et finement ponctués dans les deux tiers antérieurs, les points y étant sérialement disposés, éparsément et très finement ponctués sur le tiers apical.

Rouge, couvert d'une très fine pubescence blanchâtre. Sur la moitié antérieure de l'élytre douze séries longitudinales de très petites taches jaune blanchâtre s'étendant à la suture encore un peu plus loin en arrière. Quart apical de l'élytre couvert de fine pubescence blanchâtre et parsemé de très petites taches circulaires dénudées. En plus sur chaque élytre une large bande transverale postmédiane brun rougeâtre incurvée (à convexité du côté basilaire). Antennes revêtues de pubescence brun rougeâtre, la moitié basilaire des articles 3 et 4 et la partie basilaire des articles 5 à 9 à pubescence blanchâtre.

Long.: 6 mm.; Larg.: 2 mm. 3/4.

Décrit sur un individu de l'Ile de Timor, à l'Institut Royal des Sciences Naturelles de Belgique.

255. ***Exocentrus seriatomaculatus*** Schwarzer

Exocentrus seriatomaculatus Schwarzer, 1925, *Ent. Bl.* **21** : 147 ; Gressit, 1951, *Longicornia*, **2** : 526.

Antennes un peu plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux de moitié plus longs que les joues. Pronotum presque deux fois et demie plus large que long, pourvu d'une petite épine latérale pointue, dirigée vers l'arrière. Elytres peu densément et finement ponctués, les points sérialement disposés.

Rouge foncé, couvert d'une fine pubescence soyeuse grise. Elytres revêtus de pubescence brun rougeâtre, parsemés de petites taches blanches rangées en sept séries longitudinales sur chacun, les rangées 3 à 5 (compté de la suture) interrompues peu largement après le milieu. Antennes à pubescence brun rougeâtre foncé.

Long.: 4 mm. 1/2 ; Larg.: 1 mm. 3/4.

Décrit sur des individus de l'Ile de Formose : Kankau, au Musée de Senckenberg.— Ile Mindanao : Kolambugan (*idem*).

8. ***EXOCENTRUS*** Sousgenre ***FORMOSEXOCENTRUS*** nov.

Troisième article des antennes beaucoup plus long que le quatrième. Elytres arrondis à l'apex et pourvus de points irrégulièrement disposés.

Type : *Exocentrus variepennis* (Schwarzer).

256. ***Exocentrus variepennis*** (Schwarzer)

Camptomyme ? variepennis Schwarzer, 1925, *Ent. Bl.* **21** : 147.
Exocentrus variepennis (Schwarzer), Gressitt, 1938, *Phillipp. Journ. Sc.* **65** : 168 ; 1951, *Longicornia*, **2** : 526.

Antennes d'un tiers plus longues que le corps, le troisième article un peu plus long que le scape. Lobes inférieurs des yeux un peu plus longs que les joues. Pronotum fortement transverse, pourvu d'une épine latérale pointue fortement recourbée. Elytres assez densément et très finement ponctués sur les deux tiers antérieurs.

Brun noir. Elytres bruns, marbrés de blanchâtre dans la moitié antérieure et ornés d'une étroit bande transversale postmédiane ondulée blanchâtre. L'extreme base des articles antennaires 4 à 10 à pubescence blanchâtre. Entièrement garni de longs poils dressés noirs.

Long.: 3 mm.; Larg.: 1 mm.

Décrit sur un individu de l'Ile de Formose : Kankau, au Musée de Senckenberg.

9. EXOCENTRUS SOUSGENRE ***TUBERCULEXOCENTRUS*** NOV.

Troisième article des antennes beaucoup plus long que le quatrième. Elytres arrondis à l'apex, pourvus de points subsérialement disposés ainsi que, chacun, d'une petite bosse discale postbasilaire.

Type : *Exocentrus basituberculatus* Pic.

257. ***Exocentrus basituberculatus*** Pic

Exocentrus basituberculatus Pic, 1933, *Mél. exot. ent.* **62** : 29.

Antennes un peu plus longues que le corps, le troisième article aussi long que le scape. Lobes inférieurs des yeux sensiblement moins longs que les joues. Pronotum transverse, pourvu d'une épine latérale pointue, fortement recourbée. Elytres densément et finement ponctués dans la moitié antérieure, les points en partie alignés, très finement et éparsément ponctués dans la moitié postérieure, à angle apical sutural indiqué, pourvus, chacun, d'une petite bosse discale postbasilaire.

Tête, pronotum et quart basilaire des élytres rouge, les trois quarts postérieurs des élytres d'un noir luisant. Chaque élytre avec deux bandes blanchâtres floues et peu apparentes, une prémédiane incurvée et une postmédiane transversale. Dessous du corps noir. Prosternum et pattes rouges. Antennes rouges, la moitié apicale du troisième article et les 4 à 11 brun foncé, le quart basilaire du quatrième article à pubescence blanche.

Long.: 4 mm.; Larg.: 1 mm. 2/3.

Décrit sur un individu du Tonkin : Hoa-Binh, dans la coll. Pic.

10. EXOCENTRUS SOUSGENRE ***DENTEXOCENTRUS*** BREUNING

Exocentrus Sousgenre *Dentexocentrus* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 135.

Troisième article des antennes un peu moins long que le quatrième. Chaque élytre étiré en une épine apicale.

Type : *Exocentrus dentipes* Breuning.

258. ***Exocentrus dentipes*** Breuning

Exocentrus (*Dentexocentrus*) *dentipes* Breuning, 1956, *Bull. Ann. Soc. Roy. ent. Belg.* **92** : 13.

Antennes aussi longues que le corps, le troisième article sensiblement moins long que le scape. Lobes inférieurs des yeux quatre fois plus longs que les joues. Pronotum fortement transverse, pourvu d'une assez longue épine latérale pointue dirigée vers l'arrière et précédée d'une faible bosse latérale obtuse. Elytres très densément et très finement ponctués sur les quatre cinquièmes antérieurs et étirés, chacun, en une épine apicale.

Noir, couvert de pubescence noire. Sur chaque élytre trois bandes transversales ondulées, une médiane blanchâtre, une postbasilaire et une préapicale gris clair, la première étroite, les deux autres assez larges. Dessous du corps à pubescence gris blanchâtre. Tibias et antennes rouges.

Long.: 6 mm.; Larg.: 2 mm. 1/3.

Décrit sur un individu du Congo belge : Riv. Mamboyo, Dongo au Musée de Tervueren.

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NEW AND LITTLE KNOWN EMESINAE (REDUVIIDAE, HEMIPTERA) IN THE BRITISH MUSEUM (NATURAL HISTORY), LONDON

P. WYGODZINSKY

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BY

P. WYGODZINSKY xuf.
Instituto Miguel Lillo, Tucumán, Argentina

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NEW AND LITTLE KNOWN EMESINAE (REDUVIIDAE, HEMIPTERA) IN THE BRITISH MUSEUM (NATURAL HISTORY), LONDON

By P. WYGODZINSKY

THE species of Emesinae described and discussed in the present paper were sent to me for study by Dr. W. E. China and N. C. E. Miller and belong to the British Museum (Nat. Hist.). My thanks are due to the gentlemen mentioned for giving me the opportunity to examine these insects.

Bagauda aurarius sp. n.

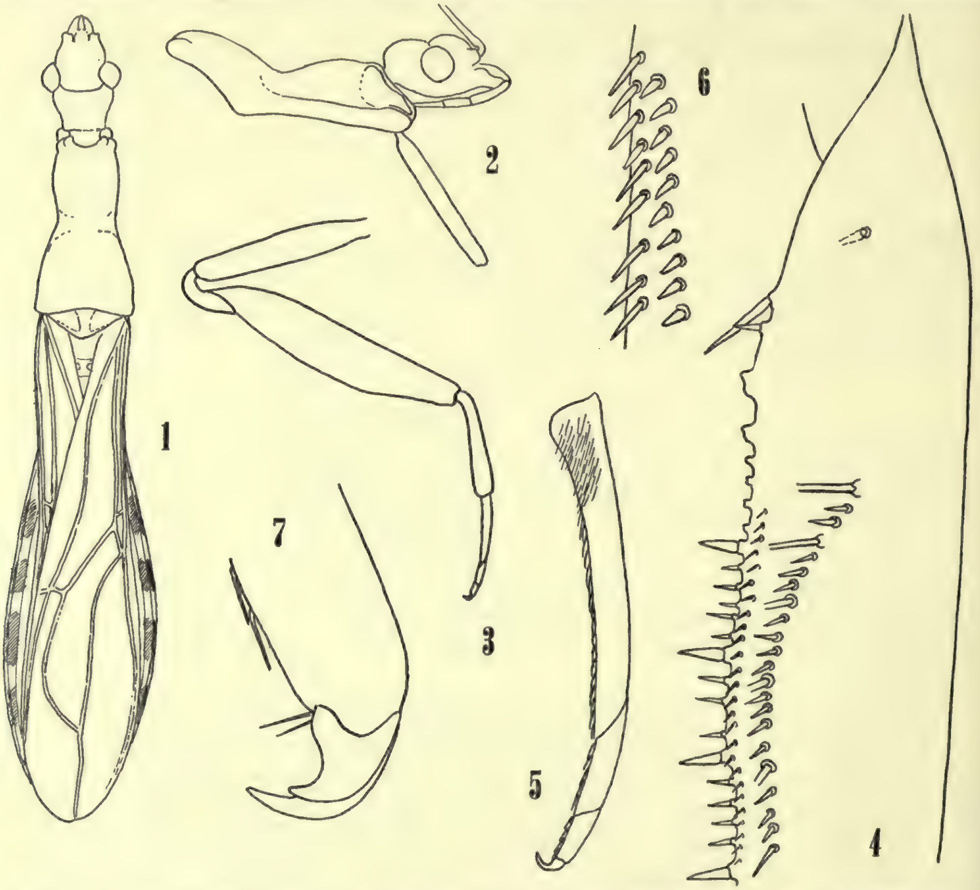
Female. Length 6·5 mm. Head, fore lobe of pronotum, coxae and abdomen ventrally, golden-brown. Hind lobe of pronotum dark brown, with a delicate line along middle, whitish; disk with 1 + 1 sublateral fasciae golden-brown. Scutellum and postscutellum dark brown. Fore wings brownish, veins dark brown, those limiting large cell, yellowish, most veins bordered with yellow; a few short stripes of the same colour on apical portion of fore wings. Connexival segment with one-third yellow and two-thirds piceous. Antennae and mid and hind legs uniformly dark brown.

Shape of head as in Text-figs. 1 and 2. Eyes rather small, subcircular in lateral aspect, not attaining level of apparent dorsal and ventral surface of head. Distance between eyes dorsally about twice their width. Shape and relative size of segments of rostrum as in Text-fig. 2. Antennae bare; second segment slightly shorter than first. Postocular portion of head with sides moderately convergent posteriorly; postero-lateral angles prominent in dorsal view; strongly declivous behind in lateral aspect.

Shape of pronotum as in Text-figs. 1 and 2. Fore and hind lobe of subequal length. Fore lobe subcylindrical, very slightly widened about middle, slightly convex above, almost smooth, without impressed longitudinal line. Hind lobe somewhat widened posteriorly, hind border slightly emarginate; surface distinctly granulose. Fore lobe laterally with a distinct longitudinal carina which attains anterior portion of hind lobe. Scutellum and postscutellum each with a rather wide median carina.

Fore wings attaining apex of abdomen, their shape and venation as in Text-fig. 1. First *r-m* cross-vein situated basad of basal angle of large discal cell; vein emanating from apex of said cell much shorter than the latter.

Legs slender. Coxa of first pair as long as fore lobe of pronotum. Femur moderately widened (Text-fig. 3). Postero-ventral series beginning at some distance from base of article, composed of several rather large spine-like setae, followed by 5 large and about 25 short spines (Text-fig. 4). Antero-ventral series widely interrupted at base (Text-fig. 4), composed of a few rather elongate spine-like setae and about 30 short spinulets. Accessory series well developed, composed of subequal small spinulets. Tibia five-eighths as long as coxa, tarsus as long as tibia, both together slightly shorter than femur. Tibia ventrally with 2 series of spines, somewhat different in shape and size (Text-fig. 6). Tarsus as in Text-fig. 5; first segment twice as long as second and third together, at base with a fascia of short bristles and on ventral surface with a series of adpressed setae. Claws subequal in size (Text-fig. 7). Mid and hind legs moderately elongate, hind femora surpassing apex of abdomen by 2·5 mm.



FIGS. 1–7. *Bagauda aurarius* sp. n. 1, General aspect, dorsal view; 2, head and prothorax, lateral aspect; 3, fore leg; 4, base of fore femur; 5, fore tarsus; 6, spines of under surface of fore tibia; 7, apex of fore tarsus with claws. Wygodzinsky del.

Abdomen subfusiform, widest on posterior third; under surface moderately convex, subflattened on basal half.

Material examined. Gold Coast Colony, Enchi, *Capt. B. D. Peake* Coll. (1 female, holotype) Brit. Mus. 1924—368.

This new species is nearest to *B. minusculus* Villiers, 1949 from which it differs as follows:

1. Vein emanating from apex of discal cell three-quarters as long as cell; basal *r–m* cross-vein at level of basal angle of discal cell. Connexivum uniformly coloured. Mid and hind femora whitish apically. Fore tarsi with one large and one very small claw . . . . *minusculus* Villiers

– Vein emanating from apex of discal cell less than one-half the length of cell; basal *r–m* cross-vein basad of basal angle of cell. Connexivum with dark and clear spots. Mid and hind femora uniformly dark. Fore tarsi with claws subequal in size *aurarius* sp. n.

Gardena cheesmanae sp. n.

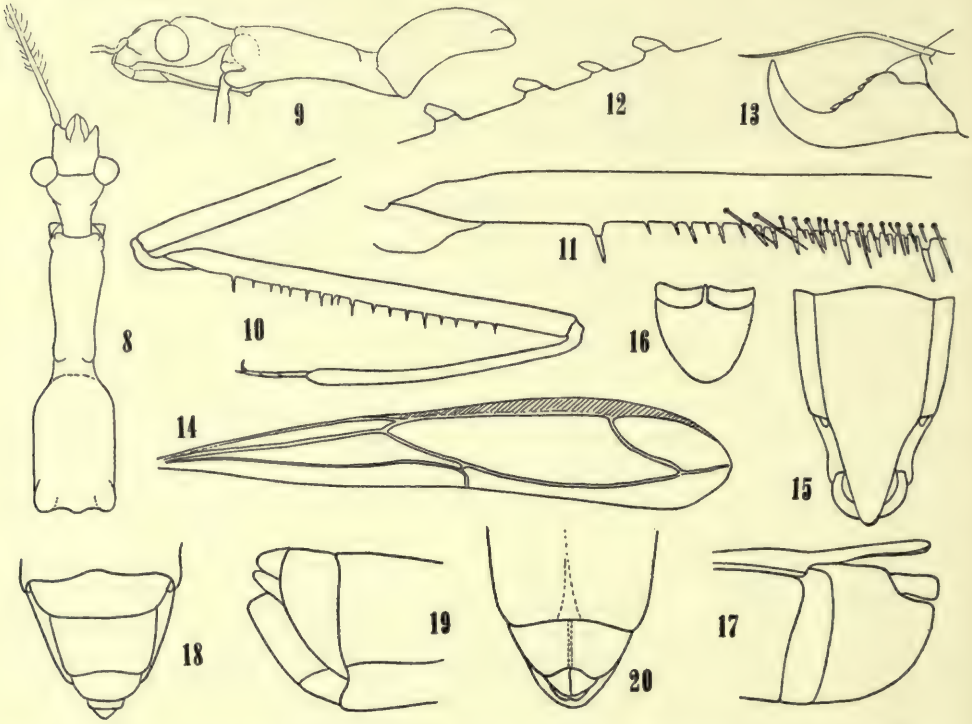
Macropterous *male* and *female*. Length 11 mm. Colour of head, thorax and abdomen, dark piceous; head somewhat clear-coloured behind eyes and at base of antenniferous tubercles. Antennae and rostrum uniformly dark. Legs dark brown, pigmentation somewhat less intense towards apex of femora and tibiae; femora of second and third pair with a wide apical and corresponding tibiae with a wide basal annulus, whitish. Fore wings greyish-brown, veins darker. Connexivum at segmental borders with a small whitish spot. Surface of head and prothorax strongly polished, bare; meso- and metathorax, legs and abdomen shining, but covered with microscopic pile, the latter rather dense on abdomen ventrally.

Head as in Text-figs. 8 and 9. Width of eyes of male one half, of female one third of the distance between them dorsally; in lateral view, eyes not attaining level of dorsal and ventral surface of head. Shape and relative size of segments of rostrum as in Text-fig. 9. Postocular region of head rather short, sides strongly convergent in dorsal view, distinctly detached from neck. First segment of antennae of male with not very numerous slender hairs which are hardly longer than diameter of segment, very sparse towards apex of article. Antennae of female completely bare. Length of first segment 5·8–6 mm.; relative length of segments = 1 : 0·8 : 0·12 : 0·35.

Shape of pronotum as in Text-figs 8 and 9; fore and hind lobe separated dorsally by a rather wide transverse depression; posterior border of pronotum bisinuate. Fore lobe microscopically reticulate, pilosity very sparse, posterior longitudinal furrow indistinct. Hind lobe conspicuously wrinkled, with exception of lateral borders and humeral callosities.

Fore wings almost attaining apex of abdomen; their venation as in Text-fig. 14. Hind wings complete.

Fore legs as in Text-figs. 10–13. Coxa slightly shorter than pronotum; tibia about as long as coxa, two-thirds of length of femur. Distance from first spine of postero-ventral series to base of article equal to about one-twelfth of total length of femur, or about twice the length of this spine plus its base. Postero-ventral series composed of about 5 large, 10–12 medium-sized and very numerous small spines inserted upon very short bases. Antero-ventral series not interrupted at base, composed of long and short spine-like setae (Text-fig. 11). Spines on under surface of tibia short, peg-like (Text-fig. 12). Tarsus as usual for the genus, the three segments of subequal length ; one claw with four small teeth on basal half (Text-fig. 13), the other one simple, with a deep incision at centre of under surface. Mid and hind legs without special characters ; hind femora surpassing apex of abdomen by 4·5 mm.



Figs. 8–20. *Gardena cheesmanae* sp. n. 8, Head and pronotum of male, seen from above ; 9, head and prothorax, lateral view ; 10, fore leg ; 11, base of fore femur ; 12, spines of under surface of fore tibia ; 13, claw of fore leg ; 14, fore wing ; 15, apex of abdomen of male, seen from above ; 16, hypopygium, seen from behind ; 17, apex of abdomen of male, lateral view ; 18, apex of abdomen of female, seen from above and behind ; 19, *idem*, lateral view ; 20, *idem*, ventral aspect. Wygodzinsky del.

Abdomen elongate fusiform, widest on posterior third. Ventral surface smooth, with very delicate transverse striae ; longitudinal carina absent. The first three visible sternites of subequal length. Sternites II–VI of female emarginate posteriorly, hind border of sternite VII straight across ; genital region of female as in Text-figs. 18–20. Sternites II–VI of male strongly emarginate behind at centre, VII moderately so, VIII almost straight across. Genital segments as in Text-figs. 15–17 ; last tergite slender, almost pointed apically, not completely covering genitalia from above ; posterior projection of hypopygium slender, short, not surpassing level of superior border of parameres when seen from behind (Text-fig. 16), the latter short, simple.

Material examined. Papua, Kokoda, 1,200 ft. x.1933, *L. E. Cheesman* coll. (1 male, holotype) Brit. Mus. 1933—427. Dutch New Guinea, Cyclops Mts., Sabron, 2,000 ft., vi.1936 (1 female, allotype) Brit. Mus. 1936—271.

This species, which is dedicated to its collector, belongs to a group of Oriental and Pacific species characterized by the small body size (15 mm. or less). *G. brevicollis* Stål, 1870 and *G. muscicapa* (Bergroth, 1906) are apparently nearest to *cheesmanae*. The following key shows the relationships of the species mentioned above :

1. Distance from first spine of fore femur to base of article equal to about twice the length of spine with its basal tubercle included (Text-fig. 11) 2

– Distance from first spine of fore femur to base of article equal to at least five times the length of said spine with its basal tubercle . . . . . . *brevicollis* Stål.

2. First article of antennae of male with dense hairs several times as long as diameter of segment, on its whole length. Fore and hind lobe of pronotum separated dorsally by a very narrow cleft ; fore lobe with very dense pile, dull appearing ; hind lobe with posterior border straight. Basal region of mid and hind tibiae with a small but distinct dark spot followed by a short white annulus. Last tergite of male relatively wide, subrounded apically . . . . . *muscicapa* (Bergroth)

– First article of antennae of male on basal half with not very numerous hairs which are not much longer than diameter of segment. Fore and hind lobe of pronotum separated dorsally by a rather extensive depression (Text-fig. 8) ; fore lobe almost without pile, appearing polished ; hind lobe bisinuate at base (Text-fig. 8). Base of mid and hind tibia uniformly white. Last tergite of male rather slender, subpointed apically (Text-fig. 15) . . . . *cheesmanae* sp. n.

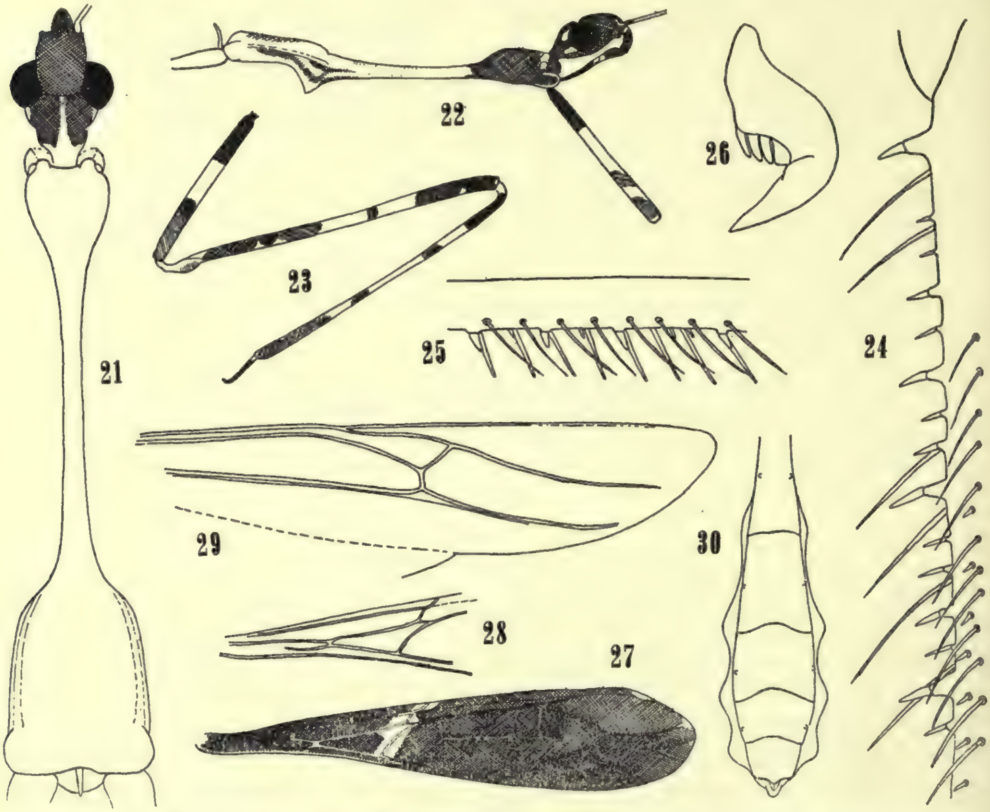
Dohrnemesa buyassuana sp. n.

Macropterous *female*. Length to apex of fore wings, 15·5 mm., of head and pronotum together, 6·8, of fore wings, 8·7 mm. General colour clear to dark brown, pattern elements yellowish to white. Body almost bare, some regions with sparse relatively long hairs, especially distinctive on pronotum, ventral surface of meso- and metathorax, and apex of abdomen ventrally.

Shape of head as in Text-figs. 21 and 22. Postocular region without dorsal projections, bisinuate laterally, moderately declivous in lateral view ; a few long hairs behind eyes. The latter large, circular in lateral view, not attaining level of dorsal or ventral surface of head ; their distance dorsally only very slightly larger than their width. Shape and relative size of rostral segments as in Text-fig. 22. Antennae slender, bare ; length of first segment, 6·5 mm.; relative length of segments: 1 : 0·95 : 0·2 : ?. Head dark brown, with 2 + 2 yellowish spots behind eyes sublaterally ; neck dorsally and a slender longitudinal line on dorsal surface of postocular portion, yellow. Rostrum piceous, with extreme base of first, apex of second and base of third segment, yellowish. First segment of antennae yellow, with one extremely short basal, one medium sized sub-basal and apical, and two wide submedian annuli, dark brown ; distance between submedian annuli shorter than their width. Second segment yellowish white, with one sub-basal, two submedian and one subapical annulus, dark brown, these annuli progressively larger towards apex ;

distance between annuli as wide as (the two basal) or shorter than (the two apical) annuli. Third segment dark brown, extreme apex whitish.

Shape of pronotum as in Text-figs. 21 and 22. Petiole very slender, not distinctly detached from fore lobe, almost twice as long as hind lobe; the latter with sides almost parallel, accompanied sublaterally on disk by 1 + 1 faint but distinct carinae; humeri very slightly elevated only; hind border faintly emarginated. Scutellum with a rather long spine, metanotum with a very short projection. Colour of fore lobe darker, of hind lobe clear brown, petiole mainly yellowish, with a delicate dark stripe dorsally; carinae of hind lobe yellowish, shining, rest of surface of hind lobe dull, slightly wrinkled transversally on anterior third. Scutellum with spine yellowish, metanotum dark brown. Lateral and ventral surface of meso- and metathorax dark brown, with rather dense short silvery adpressed hairs, partially arranged in fasciae.



FIGS. 21–30. *Dohrnemesa buyassuana* sp. n. 21, Head and thorax, seen from above; 22, head and pronotum, lateral view; 23, fore leg, with colour pattern; 24, base of fore femur, ventral portion; 25, spines of under surface of fore tibiae; 26, fore claw; 27, fore wing, with colour pattern; 28, part of venation of fore wing; 29, venation of hind wing; 30, abdomen, seen from below. Wygodzinsky del.

Fore legs very slender (Text-fig. 23). Coxa slightly longer than petiole of pronotum. Postero-ventral series of femur beginning almost at base of article, composed of about 10 larger and 40 smaller setiferous tubercles beset with short spines, the spines of the larger tubercles about as long as their bases, those of short tubercles longer than the latter (Text-fig. 24). Large tubercles together with their apical spines somewhat shorter than half the length of diameter of segment. Antero-ventral series composed of very short spines. Ventral surface of femur furthermore with two series of long slender strongly sclerotized setae. Tibia ventrally with one row of about 55 short spines of two sizes (Text-fig. 25), and two series of long setae. Tarsus short, as usual for the genus, claws with several appendages on basal half (Text-fig. 26). Mid and hind legs slender, elongate, bare; hind femora surpassing apex of fore wings by 10 mm. Fore legs yellowish white, with dark annuli as in Text-fig. 23. Mid and hind coxae dark brown; femora yellowish, with 5–6 dark annuli along their whole length, distance between them about as wide as annuli, apex whitish; tibiae yellowish-white, on basal half with 4 dark annuli, the first sub-basal one very narrow, the remaining ones wider, but shorter than the distance between them.

Fore wings surpassing apex of abdomen by about 1 mm.; their venation as in Text-figs. 27 and 28; basal discal cell elongate apically, *cu–an* cross-vein situated basad of apex of cell. Colour of fore wings rather uniformly dark brown, large discal cell and apex of wing with faint coarse yellowish reticulation; apical region of basal discal cell with a diagonal whitish spot which attains both margins. Veins dark or whitish, as in Text-fig. 27. Hind wings complete, their venation as in Text-fig. 29.

Abdomen slender at base, somewhat widened posteriorly, connexival margin undulate (Text-fig. 30); projections of last three segments the largest, identical in size. Colour of abdomen piceous ventrally, with a few yellowish spots on posterior half; connexival segments with alternate piceous and yellowish-white portions.

Material examined. Paraná de Buyassú, Lower Amazon, 17.i.1896, *E. E. Austen* Coll. (1 female, holotype) Brit. Mus. 1896—80.

This species differs from *D. santosi* Wygodzinsky, 1945, and *D. lanei* Wygodzinsky, 1945 (both from southern Brazil) by the much longer petiole of the pronotum, the distinctly undulate connexival margin and the very different colour pattern of the fore wings; it differs furthermore from *santosi* by the *cu–an* cross-vein inserted basad of the apex of the basal discal cell and from *lanei* by the small size of the larger spiniferous processes of the fore femora, in addition to other characters.

Dohrnemesa exporrecta sp. n.

Macropterous *male*. Length to apex of fore wings, 11 m. Conspicuously pictured, with pattern elements from white to clear brown and piceous. Very short hairs only present.

Shape of head as in Text-figs. 31 and 32. Anteocular portion moderately convex above; postocular region dorsally behind eyes somewhat salient laterally, strongly elevated at centre and with a short slender spine-like projection; rather strongly declivous behind. Distance between eyes dorsally distinctly less than their width; eyes rounded in lateral view, slightly surpassing level of inferior margin of head. Size and shape of rostral segments as in Text-fig. 32; second as long as first, slightly thickened anteriorly. Antennae not examined. Colour of head piceous, a small spot behind eyes laterally, apex of central dorsal projection, and a slender line on postocular region dorsally, whitish; clear brown at insertion of rostrum. First segment of rostrum whitish at base and apex, brown centrally; second segment piceous, white on apical third; third segment dark brown, white on basal third.

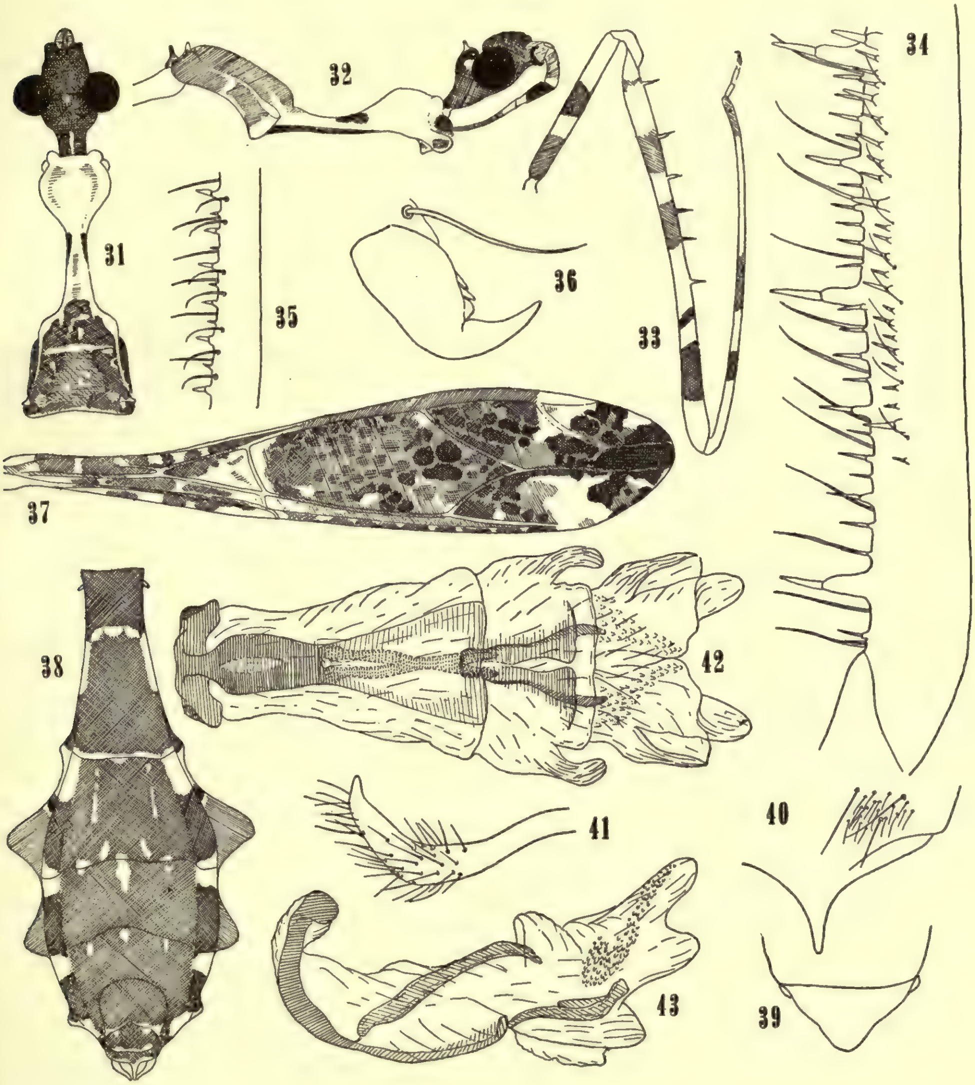
Pronotum as in Text-figs. 31 and 32. Fore lobe subglobular in dorsal view, rather sharply detached from petiole, about as long as the latter. Hind lobe three-fourths as long as fore lobe and pedunculate portion together, its sides slightly diverging posteriorly; humeri with 1 + 1 short but distinct spine-like projections; posterior border slightly emarginate. Disk smooth, sublaterally with 1 + 1 carinae which are most distinct anteriorly. Scutellum with a very short spine; spine of metanotum present, its length? (broken). Fore lobe and petiole whitish, the former with a faint brownish tinge, the latter with 1 + 1 lateral elongate piceous patches anteriorly, dorsally and posteriorly with a faint brownish longitudinal fascia. Hind lobe dark brown to piceous, rather irregularly mottled with whitish; carinae and apex of humeral spines, white. Scutellum with spine dark brown, its hind margin very narrowly white. Metanotum dark brown, whitish at insertion of spine. Pattern of prothorax laterally as in Text-fig. 32; meso- and metathorax piceous laterally and ventrally, hind border of mesothorax broadly whitish at sides.

Fore legs as in Text-fig. 33. Coxa as long as fore lobe and petiole of pronotum together. Postero-ventral series of femur beginning at base of article, composed of 6 large and approximately 45 medium-sized and small spiniferous tubercles (Text-fig. 34); spines of large tubercles about as long as the latter, those of small ones considerably longer relatively; large tubercles together with spines as long as diameter of segment. Antero-ventral series not interrupted at base, composed of 12–14 medium-sized spiniferous projections and about 70 small and very small slender spines inserted upon very short bases, these spines become slightly longer towards apex of segment. Setae accompanying antero-ventral series very short and slender, almost indistinguishable from ordinary hairs, those accompanying postero-ventral series large as usual for the genus. Ventral surface of tibia with about 70 small spines of roughly two sizes (Text-fig. 35), arranged in a single series, accompanied by two rows of long setae. Fore tarsus and claws as usual for the genus (Text-fig. 36). Mid and hind legs not examined. Colour of fore legs white, with brown and piceous annuli as in Text-fig. 33.

Fore wings surpassing apex of abdomen by about 1 mm., their shape and venation as in Text-fig. 37. Basal discal cell only slightly elongated at inner apical angle; *cu–an* cross-vein inserted very little basad of apex of cell. General colour of fore wings clear brown, mottled with dark brown and piceous; apical two-thirds of basal discal cell with adjacent regions and 1 + 1 large spots laterally beyond apex of discal cell, white. Venation of hind wing as shown for *buyassuana*.

Abdomen as in Text-fig. 38, shortly pedunculate at base, widened on apical two-thirds, with connexival segments strongly lobate, most conspicuously so on segment

V. Spiracles of segment III shortly pedunculate, the remaining sessile. Dorsal or ventral projections lacking. Ventral surface flattened on anterior, moderately convex on posterior half. Hypopygium short, covered dorsally by the subtriangular eighth tergite (Text-fig. 39), posteriorly with a spine-like upwardly directed pro-



FIGS. 31–43. *Dohrnemesa exporrecta* sp. n. 31, Head and pronotum, dorsal view; 32, head and prothorax, lateral aspect; 33, fore leg, with colour pattern; 34, base of fore femur; 35, spines of ventral surface of fore tibia; 36, claw of fore leg; 37, fore wing, with colour pattern; 38, abdomen, seen from below; 39, apex of abdomen of male, seen from above; 40, apex of hypopygium, high magnification; 41, paramere; 42, phallus, dorsal view; 43, *idem*, lateral aspect. Wygodzinsky del.

jection at centre (Text-fig. 40). Shape and chaetotaxy of parameres as in Text-fig. 41. Shape and structure of phallus as in Text-figs. 42 and 43.

Material examined. St. Vincent, West Indies, *H. H. Smith* Coll. (1 male, holotype) Brit. Mus. 1895—206.

This insect differs from the species included heretofore in *Dohrnemesa* by numerous characters, such as the much shorter pronotum, the wide abdomen with its flaring connexival segments, the distinctly spined humeri, the almost inconspicuous row of long setae accompanying the antero-ventral series of the fore femora, and the smaller size. "*Westermannia*" *difficilis* Dohrn, 1860 (Colombia) is apparently nearly related to the present species, but to judge from its colour characters it is clearly distinct. "*Westermannia*" *difficilis* sensu Champion, 1898, is equally different, as shown by the figures given by that author, though it doubtlessly belongs to the same group.

Stenolemus eucnemus sp. n.

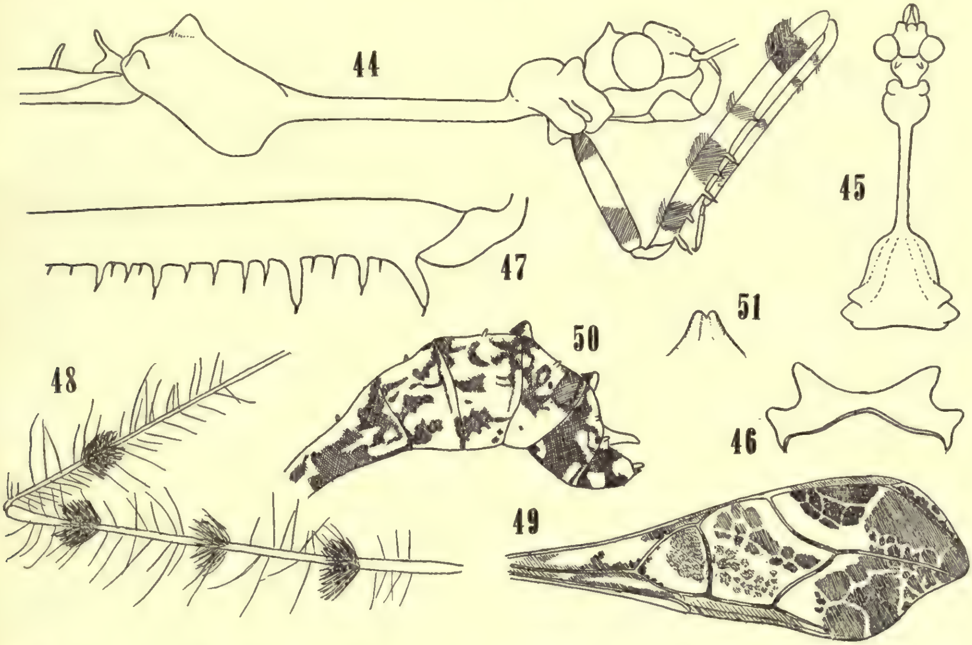
Male. Length to apex of fore wings, 11·2 mm. General colour whitish, pattern elements clear to dark brown. Body surface with rather short and not very dense pubescence; long hairs present in small number only.

Head as in Text-figs. 44 and 45, short. Anteocular region strongly elevated; postocular region behind constriction dorsally with 1 + 1 pointed cone-shaped projections. Eyes very large; their distance dorsally equal to their width; their outline almost circular in lateral view, slightly surpassing level of inferior border of head. Rostrum as in Text-fig. 44; second segment as long as first, very strongly swollen; third very slender. Antennae slender; first and basal third of second segment with a moderate number of long erect hairs; rest with short pubescence only. Length of first segment 3·2 mm.; relative length of segments = 1 : 0·9 : 0·15 : ? Colour of head piceous, with most of anteocular region dorsally, apex of postocular projections and a median longitudinal line dorsally on postocular portion, yellowish. Rostrum brown, base and apex of first and apex of second segment, yellow. First segment of antennae yellowish, with three narrow brown annuli, one sub-basal, one submedian and one subapical; second segment whitish, with three black annuli: one very narrow sub-basal, one wider submedian and one very wide subapical, the latter separated from apex of segment by a narrow white annulus as wide as the sub-basal brown one; third segment brown, with extreme apex whitish.

Shape of prothorax as in Text-figs. 44 and 45. Fore lobe of pronotum very small, globular, distinctly detached from petiole; the latter more than twice as long as fore, and as long as hind lobe, very slender, cylindrical. Hind lobe bell-shaped, its sides distinctly divergent towards rear, with 2 + 2 stout projections, those of disk divergent, somewhat larger than the lateral ones (Text-fig. 46). Disk with a distinct median longitudinal depression limited by 1 + 1 wide rounded carinae which lead to the submedian projections. Spines of scutellum and metanotum of medium size, subcylindrical, with inconspicuous pubescence only. Thorax without long hairs, its general colour yellowish-white; petiole and fore lobe of pronotum with faint clear brown pattern elements dorsally; lateral and ventral surface of meso-

and metathorax piceous, scutellum and metanotum dark brown, posterior border of scutellum and extreme apices of spines, yellowish. Surface of pronotum polished.

Fore legs as in Text-figs. 44 and 47; coxa slightly shorter than hind lobe of pronotum. Large spiniferous processes of femur as in Text-fig. 57, the first inclined towards base, larger than any of the others, followed by another projection almost as large, and 2–3 smaller ones, in addition to the usual short spiniferous projections; total number of spines of postero-ventral series 17. Colour of fore legs yellowish, with brown annuli as in Text-fig. 44, preapical annulus the darkest. Dark annuli of femur and base of tibia accompanied dorsally by tufts of dark hairs; rest of fore legs with short pile and isolated long hairs. Femur of second pair with 3 brush-like tufts of medium-sized hairs (Text-fig. 48), the sub-basal and subapical one piceous, the submedian one clear brown; mid tibia with one piceous sub-basal tuft. Hind femora with 4 tufts, the two basal and the subapical one piceous, the third tuft clear brown.



Figs. 44–51. *Stenolemus eucnemus* sp. n. 44, Head and thorax, lateral view, only fore leg with colour pattern shown; 45, head and pronotum, dorsal view; 46, processes of hind lobe of pronotum, seen from behind; 47, base of fore femur; 48, femur and part of tibia of second pair of legs; 49, fore wing; 50, abdomen of male, lateral view; 51, apex of process of hypopygium. Wygodzinsky del.

Fore wings rather wide, surpassing apex of abdomen by 2 mm., their shape and venation as in Text-fig. 49, their colour white, pattern elements from clear brown to piceous, their distribution as in Text-fig. 49. Hind wings brownish-white, somewhat darker at apex, their veins dark brown.

Abdomen as in Text-fig. 50, without dorsal or ventral projections; connexival angles somewhat salient, the two last lobate. Posterior projection of hypopygium broad, with a short median emargination apically (Text-fig. 51). Colour of abdomen yellowish-white, with extensive piceous pattern as in Text-fig. 50. Surface smooth, almost shining, with sparse short pile and isolated long hairs.

Material examined. New Guinea, *ter Porten* Coll. (1 male, holotype).

Stenolemus eucnemus is apparently related to *S. muiri* (Kirkaldy, 1908) from Fiji, but differs from that species by the smaller number and different colouring of the tufts on mid and hind legs, the absence of wool-like pile on the body, the different colouring of fore wings and abdomen, and the differently shaped process of the hypopygium.

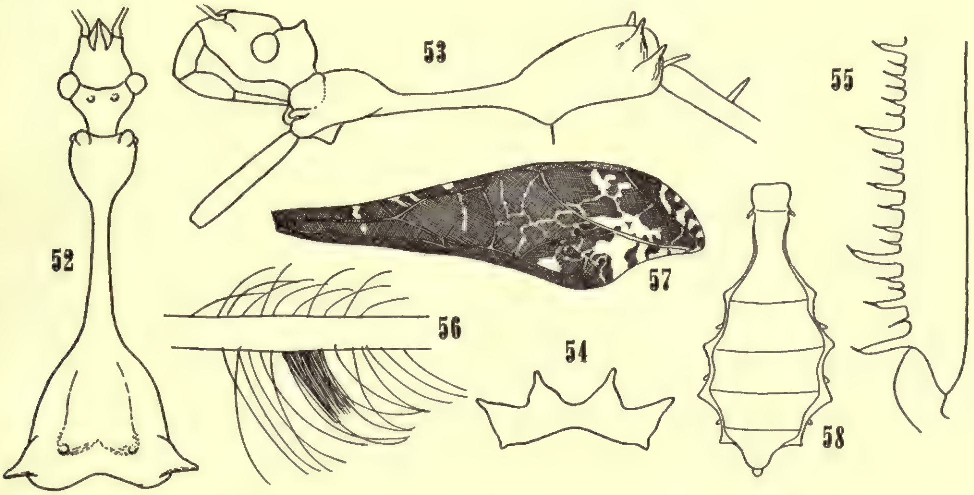
Stenolemus facetus sp. n.

Male. Length 11·5 mm. General colour dark brown, pattern elements yellowish white and silvery. Various body regions with short woolly pile ; long hairs sparse.

Shape of head as in Text-figs. 52 and 53, subfusiform in lateral view. Postocular region short, with 1 + 1 small but distinct tubercles, strongly declivous behind tubercles, in lateral aspect. Eyes very small, subcircular in outline, far remote from level of dorsal and ventral surface of head, in lateral view ; distance between eyes dorsally equal to twice their width. Shape of rostrum as in Text-fig. 53, second segment very slightly swollen only. Head covered with short woolly pile ; only a few moderately long hairs present. Colour of head dark brown, with a faint median longitudinal stripe on postocular region dorsally, yellowish. Rostrum clear brown, apex of segments yellowish. Length of first segment of antennae 3·8 mm.; relative length of segments = 1 : 1 : 0·21 : 0·32. Segments I and II with numerous erect isolated very long hairs ; III and IV with hairs not longer than diameter of segment. Colour of antennae dark brown, first segment with 2 or 3 rather wide faint yellowish annuli, second segment with 3 or 4 more distinct whitish annuli which are slightly shorter than the dark spaces between them ; third uniformly dark, fourth uniformly clear coloured.

Pronotum as in Text-figs. 52 and 53. Fore lobe small, sides regularly convergent towards rear ; petiole elongate, twice as long as fore and about as long as hind lobe, slender, distinctly widened posteriorly ; hind lobe bell-shaped, its posterior border distinctly emarginate, disk with 2 + 2 rather large projections, wide at base. slender and pointed apically (Text-fig. 54) ; disk slightly flattened before submedian projections. Spine of scutellum inclined, of metanotum erect, both slender. Anterior and especially posterior lobe of pronotum covered with short wool-like pile, petiole almost bare, shining. Long hairs in moderate number on petiole and hind lobe. Meso- and metathorax with woolly pile. Colour of thorax dark brown, pile yellowish-brown ; tubercles of collar clear brown ; hind lobe at posterior margin centrally with a small yellowish spot. Meso- and metanotal spine dark brown.

Fore legs relatively large and slender. Coxa about as long as hind lobe of pronotum. Postero-ventral series of femur composed of 5–6 large and about 30 smaller spiniferous processes ; basal process inserted at base of article, somewhat inclined towards base, about as long as diameter of segment and slightly longer and stronger than any of the remaining processes. Antero-ventral series not interrupted at base, composed of about 5 small and 35 very small spinulets inserted upon short bases. Tibia with about 40 rather long spines arranged in two irregular series. Colour of fore legs clear brown inclusive spiniferous processes of femora ; coxa with one large median and one short apical annulus, yellowish ; trochanter yellow ; femur with four wide yellowish annuli, one sub-basal, two submedian and one apical ; tibia with 4 or 5 faint yellowish annuli ; tarsi yellowish. Moderately long hairs present on all segments, not forming tufts. Mid and hind legs slender ; hind femora surpassing apex of fore wings by about 4 mm. Long hairs isolated. Femora II with a dorsal tuft somewhat basad of middle (Text-fig. 56) ; femora III with a similar though smaller dorsal tuft sub-basally and a large tuft occupying both surfaces at centre. Tibiae II and III at some distance from base with a tuft occupying both surfaces. Colour of femora and tibiae dark brown, somewhat clearer towards base of femora and on apical half of tibiae ; annuli very faint ; tufts dark brown.



FIGS. 52–58. *Stenolemus facetus* sp. n. 52, Head and pronotum, seen from above ; 53, *idem*, lateral view ; 54, processes of posterior lobe of pronotum, seen from behind ; 55, base of fore femur ; 56, portion of femur of second pair of legs ; 57, fore wing ; 58, abdomen of male, dorsal view. Wygodzinsky del.

Shape and venation of fore wings as in Text-fig. 57 ; posterior discal cell not subdivided. Pattern of fore wing as in Text-fig. 57 ; general colour dark brown ; reticulation of cells yellowish ; large clear spots silvery white, nacreous. Hind wings entirely dark brown, veins and faint reticulation slightly clearer. Fore wings surpassing apex of abdomen by about 1 mm.

Abdomen widely oval, shortly pedunculate at base (Text-fig. 58) ; angles of connexival segments salient ; spiracles inserted on ventrally situated conical projections ; other dorsal or ventral projections lacking. Ventral surface with short woolly pile and not very numerous long hairs. Colour dark brown, connexivum partly yellowish. Posterior projection of hypopygium short, truncate apically.

Material examined. Philippinen, *Boettcher* (1 male, holotype, ex Taeuber coll.) Brit. Mus. 1949—474.

Stenolemus facetus sp. n. seems to be most nearly related to *S. plumosus* Stål, 1870, equally from the Philippine Islands. The two species may be distinguished by the following set of characters :

1. Petiole of pronotum longer than hind lobe. Petiole dorsally, processes of hind lobe, and spine of scutellum, mainly whitish. Spiniferous processes of fore femora, whitish. Femur II without, femur III with two complete tufts of dark hairs. Articulation of hind femora and tibiae broadly white . . . . *plumosus* Stål

– Petiole of pronotum not longer than hind lobe. Petiole dorsally, processes of hind lobe and spine of scutellum, dark brown. Spiniferous processes of fore femora, dark brown. Femur II with one dorsal, femur III with one dorsal and one complete tuft of dark hairs. Articulation of hind femora and tibiae brown . . . . *facetus* sp. n.

Stenolemus ornatus shinyanga subsp. n.

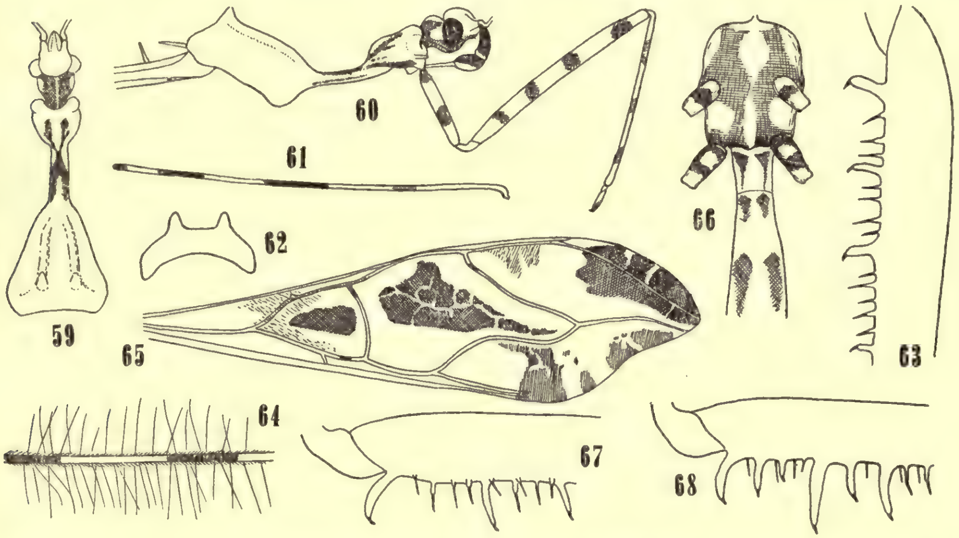
Female. Length to apex of fore wings 15 mm. General colour yellowish white, pattern elements brown. Hairs long, not very numerous.

Head as in Text-figs. 59 and 60. Distance between eyes dorsally one and a half times their width ; in lateral aspect, eyes not attaining level of dorsal or ventral surface of head, their shape subsemicircular. Postocular portion of head rather high, with a faint median longitudinal sulcus dorsally, without distinct projections. Rostrum as in Text-fig. 60 ; first segment stout, second moderately swollen, third slender. First segment of antennae with numerous very long hairs, the remaining with short pile only. Length of first segment 4 mm.; relative length of segments = 1 : 0·8 : 0·17 : ? Under surface of head dark ; dorsal surface whitish before eyes, dark behind, with a median longitudinal stripe dorsally and a spot behind each eye laterally, whitish. Rostrum dark ; first segment apically, second apically and ventrally, third entirely, whitish. Antennae of the general colour ; first segment with four dark brown annuli, one very narrow apical, one very wide subapical, another one submedian, and one medium-sized sub-basal, the latter somewhat clearer than the remaining ; second segment with one very narrow basal, one wide apical and two wide submedian annuli, the white spaces between them shorter than the dark ones ; third segment entirely brown.

Pronotum as in Text-figs. 59 and 60. Fore lobe approximately bell-shaped, narrower towards rear ; pedunculate portion slightly longer than fore lobe ; hind lobe subtriangular, near posterior border with 1 + 1 rather short cone-shaped projections (Text-fig. 62) ; disk flattened above at centre, depressed portion limited by 1 + 1 rather wide low carinae which terminate posteriorly at projections ; hind margin of pronotum almost straight across. Spine of scutellum slender, pointed apically, almost horizontal ; metanotal spine erect, slightly thickened at apex. Pronotum of the general body colour, petiole darkened above, fore lobe dorsally with 1 + 1 submedian dark irregularly shaped stripes, also somewhat darkened below. Spines of scutellum and metanotum white.

Fore legs as in Text-figs. 60 and 63. Coxa somewhat shorter than fore lobe and petiole of pronotum together. Femur slender. Postero-ventral series composed of

5 large and 25 smaller spiniferous projections; basal process inserted at a slight distance from base of article, inclined towards the latter, slightly larger than any of the others. Antero-ventral series not interrupted at base, composed of about 40 subequal spinulets inserted upon short bases. Tibiae with about 30 short spines arranged in two irregular series. Dark annuli of fore legs as in Text-fig. 60. Mid and hind legs slender; hind femora surpassing apex of fore wings by about 3 mm. Colouring of coxae as in Text-fig. 66. Trochantera whitish. Femora with five dark annuli (apices and bases white), the two sub-basal annuli on femur II rather short, clear brown, the three remaining ones and all annuli of hind femora, wide, dark brown. Tibiae with an indistinct brown spot at base, followed by a wide white and a wide brown annulus, rest of tibiae yellowish-white. Hairs of mid and hind legs very long, moderately numerous, their arrangement identical on clear and dark portions (Text-fig. 64).



FIGS. 59–68. *Stenolemus ornatus shinyanga* subsp. n. 59, Head and pronotum, seen from above; 60, head and prothorax, lateral view; 61, colour pattern of first antennal segment; 62, processes of posterior lobe of pronotum, seen from behind; 63, base of fore femur; 64, portion of hind femur; 65, fore wing; 66, meso- and metathorax and base of abdomen, ventral aspect. 67, *Stenolemus edwardsii*, base of fore femur. 68, *Stenolemus papuensis*, base of fore femur. Wygodzinsky del.

Shape and venation of fore wings as in Text-fig. 65; posterior cell not subdivided. Pattern of fore wing as in Text-fig. 65; hind wings whitish, slightly darkened at apex. Fore wings surpassing apex of abdomen by about 3 mm.

Abdomen slender, fusiform, widest on posterior third; angles of connexival segments not salient. Spiracles inserted on small cone-shaped projections. Dorsal or ventral processes lacking. Colour of anterior portion of abdomen ventrally mainly clear, on posterior half mainly dark.

Material examined. Tanganyika, Old Shinyanga, at light, 5.vi.1953, *E. Burtt* Coll. (1 female, holotype).

The present specimen is very similar to *Stenolemus ornatus* Villiers, 1949 (Belgian Congo). However, it is very considerably larger than the type of *ornatus* (15 versus 9 mm.) which is much more than the normal range of variability in species of the present genus. The remaining characters given in the rather short description of Villiers' species agree with those found in the specimen from Tanganyika, though a detailed comparison might show additional differences. Under these circumstances, a subspecific status for the insect examined now seems justified.

Stenolemus papuensis Horváth

Material examined. Kokoda, Papua, 1,200 ft., v, vi, viii and ix.1933, *L. E. Cheesman* Coll. (3 males, 1 female) Brit. Mus. 1933—427.

The specimens agree quite well with Horváth's 1914 original description. *S. papuensis* is very much like *edwardsii* Bergroth, 1916, now known to be widely distributed over Australia. The main difference is found in the size and distribution of the spiniferous processes of the fore femora : in *edwardsii*, the basal process of the postero-ventral series is slightly but distinctly longer than any of the others (Text-fig. 67), whilst in *papuensis* the third process is decidedly the largest (Text-fig. 68) ; in *edwardsii* the large spiniferous processes also seem to be somewhat more numerous.

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NATURAL HISTORY

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ENTOMOLOGY Vol. 7 No. 7
LONDON : 1958

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BY

D. E. KIMMINS

Department of Entomology, British Museum (Natural History)

Pp. 347–368 *;* 14 *Text-figures*

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NEW SPECIES AND SUBSPECIES OF ODONATA

By D. E. KIMMINS

FROM time to time, when dealing with small collections of Odonata accessions in the British Museum (Nat. Hist.), isolated new species have been noticed and described. As the collections themselves were not of sufficient interest to warrant separate publication, the descriptions have accumulated and it is now considered desirable to publish them in a short paper, since the specimens are in the Museum collections under manuscript names. Five species and one subspecies are described and notes are given on a previously described species.

Protosticta rufostigma sp. n. (Fam. Platystictidae)

(Text-fig. 1)

S. INDIA: Tinnevelly District, Naraikadu, 2,500–3,000 ft., 3–8.ix.1938, G. M. Henry, 1 ♂, 2 ♀.

♂. Head with labium brownish black, labrum light blue, rather broadly bordered with brownish black on anterior margin. Clypeus pale blue, frons glossy blue-black, vertex and occiput rather dull blue-black.

Prothorax greenish white, posterior lobe blackish, this colour extending slightly on to the middle of the mid-lobe. Synthorax greenish black, with a bluish white, oblique stripe on each side to the mid legs and a similar stripe on the posterior part of the metepimeron, extending on to the hind legs. Legs brownish white.

Abdomen blackish brown, marked with yellowish white and with blue as follows: Segment 1, and possibly 2, yellowish white laterally; segment 3 with a narrow, basal annule of yellowish white, divided dorsally with blackish, segments 4–7 with broader, yellowish white annules, only slightly widened laterally, segment 8 with its basal half blue, not extended apically at sides, 9 and 10 black. Anal appendages black (Text-fig. 1B–D); similar in general pattern to *P. davenporti* Fraser, but the superiors with the basal tooth less acute and the thumb-like lobe more slender. Inferiors in dorsal aspect a little stouter.

Wings hyaline, very faintly smoky; pterostigma (Text-fig. 1A) rather large, reddish brown (when viewed against a dark ground there is a narrow surround of whitish pruinescence); 14 postnodals in fore wing, 13 in hind wing; Riv + v arising well distal to subnode.

♀. Head and thorax similar to male. Legs paler, knees and dorsal carinae of femora brown. Wings as in male. Abdomen marked as in male, but with bluish white instead of yellowish white. Segment 7 with basal annule occupying about the basal fourth. Vulvar scale blackish, robust.

Length of abdomen, ♂, 46 mm., ♀, 36 mm.; hind wing, ♂, 23 mm., ♀, 22 mm.

Holotype male, allotype and paratype females in British Museum (Nat. Hist.). This species is closely related to *P. davenporti* Fraser, but may be distinguished by the larger pterostigma, differences in the pattern of the prothorax and the eighth abdominal segment, and differences in the anal appendages of the male. The pterostigma recalls that of *P. sanguinostigma* Fraser, but the anal appendages of that species are quite distinct.

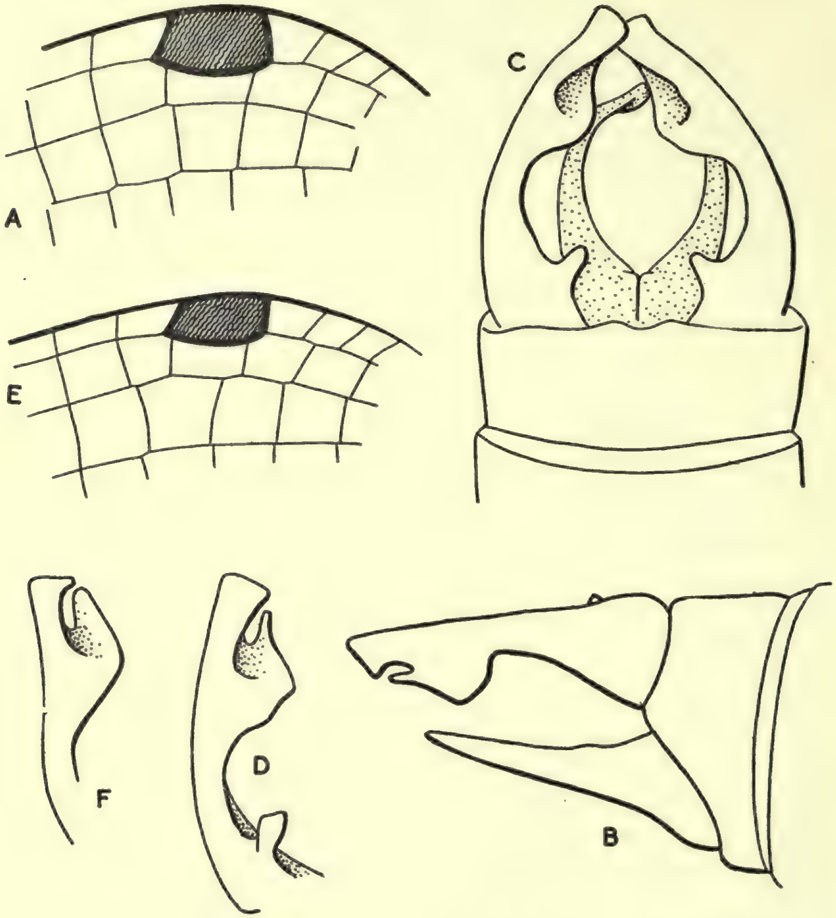

FIG. 1. *Protosticta rufostigma* sp. n. ♂(A–D) and *P. davenporti* Fraser, ♂ (E–F). (A), pterostigma of fore wing; (B), anal appendages, lateral; (C), the same, dorsal; (D), superior appendage from above and within; (E), pterostigma of fore wing; (F), superior appendage from above and within.

Calicnemia nipalica sp. n. (Fam. Platycnemididae)

NEPAL: Phewa Tal, nr. Pokhara, 2,500 ft., 8.v.1954, J. Quinlan (B.M. Nepal Exped.), 10 ♂.

Head with labium dull yellowish; genae olive-green (yellowish when immature), labrum and clypeus shining dark brown; frons and vertex dull black, slightly pruinosed (immature with a dull yellowish, transverse band linking the genae just above the clypeus and another narrow transverse band at the level of the ocelli). With age the outer parts of this band become pruinosed. Postocular spots narrow, yellowish. Antennae black, apices of basal and second segments yellowish.

Prothorax black, slightly pruinosed, a small yellowish spot on each side near base. Mesepisternum black, antehumeral stripes narrow, yellowish when young, becoming pruinosed lilac or blue. Mesepimerum black, pruinosed, with exception of lower angle, which is yellowish. Mesinfraepisternum largely black. Episternum, epimerum and infraepisternum of metathorax largely black when mature, largely yellowish when young, with a black stripe along the posterior margin of episternum and a fuscous cloud over infraepisternum. Venter yellowish, becoming fuscous. Legs black, femora yellowish at extreme bases.

Abdomen with segment 1 yellowish, becoming fuscous; segments 2–6 deep red, faintly pruinosed, 2–5 with a narrow, fuscous, apical ring, 6 with a broader ring, 7–10 black. Anal appendages yellowish, similar in form to *mortoni*, *miniata*, etc.

Wings with black venation and fuscous stigma. Postnodals 18, 19 in fore wing, 17, 16 in hind wing.

Length of abdomen, 23 mm., of hind wing, 24 mm.

Holotype ♂ and paratypes in British Museum (Nat. Hist.). In markings of the body, this species resembles *C. erythromelas* Sélys, but that species has distinctive anal appendages. It differs from *miniata* in the greater degree of black on the head, narrower yellow antehumeral stripes, soon becoming pruinosed and the yellow anal appendages. The similarity in anal appendages of a number of species in this genus makes one wonder whether we are perhaps dealing with subspecies of a widely distributed species, differing chiefly in colour and pattern.

Pseudagrion guichardi sp. n. (Fam. Coenagriidae)

(Text-fig. 2)

ETHIOPIA: Nr. Cencia, 29.iii.1948, K. M. Guichard, 18 ♂; R. Hawash, nr. Moggio, iv.1948, K. M. Guichard, 1 ♂.

Head with labium, labrum and anteclypeus yellowish, postclypeus shining black. Frons dull black, with a narrowly interrupted, transverse, yellow band below the antennae, linking up with the yellowish genae. Postocular spots small, yellowish. Occiput yellowish.

Prothorax black, with a greenish sheen, lateral margins and a small lateral spot yellowish. Synthorax black above, with a greenish sheen, mid-dorsal carina finely yellowish. Antehumeral stripe narrow, yellowish. The black extends laterally beyond the humeral suture. Sides pale yellowish, marked with black as in Text-fig. 2A. Legs blackish, femora narrowly marked with yellowish on anterior surfaces at base, posterior and ventral surfaces yellowish.

Abdomen black above, heavily pruinosed as far as sixth segment, eighth to tenth segments marked with blue dorsally as in Text-fig. 2B. Lower lateral margins of segments bluish or yellowish. Superior anal appendages (Text-figs. 2C, D) blackish brown, inferiors yellowish. Upper branch of superiors with a small basal as well as an apical tooth.

Length of abdomen, 29–33 mm., of hind wing, 23–26 mm.

Holotype ♂ and paratypes in British Museum (Nat. Hist.). This species differs from *Ps. kersteni* (Gerstaecker) in the more robust lower branch of the superior appendages, the presence of a small basal tooth on the inner margin, the pale labrum and in the form of the penis, which resembles that of *epiphonematicum*. In the presence of a basal tooth on the inner margin of the superior appendages it resembles *furcigerum* (Rambur) but it differs in the longer lower branch. From *epiphonematicum* it differs in colouring and in the form of the anal appendages.

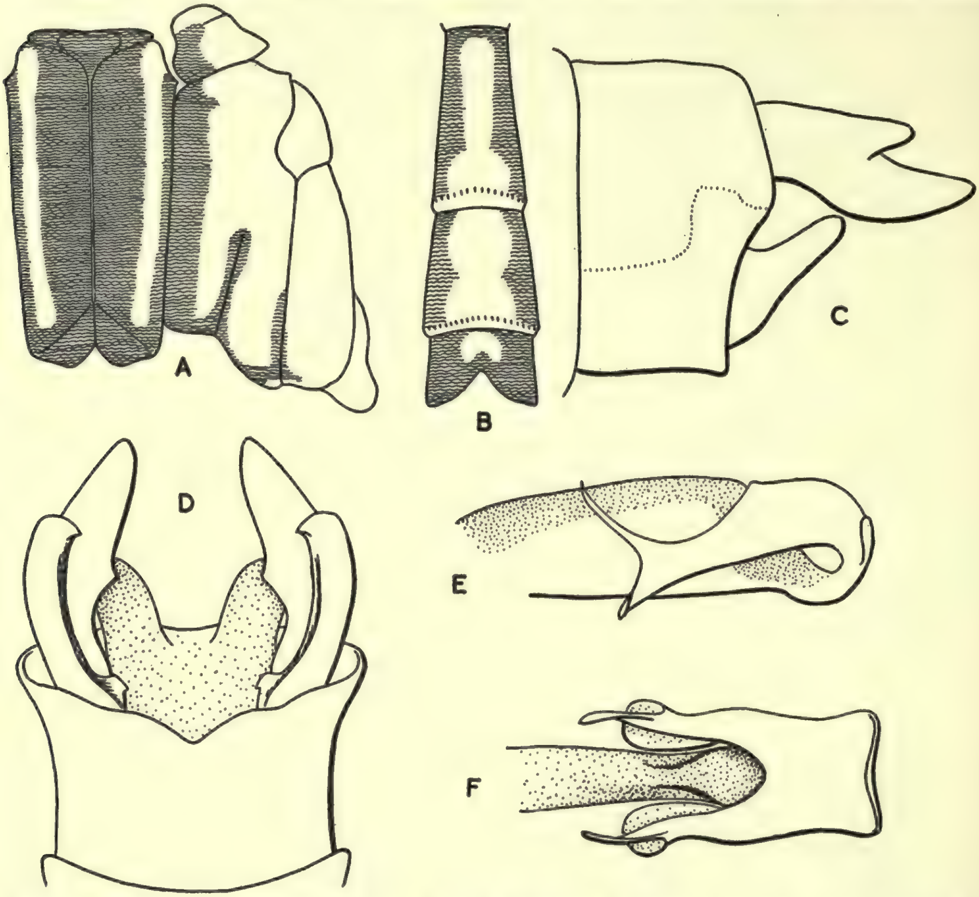

FIG. 2. *Pseudagrion guichardi* sp. n. ♂. (A), diagram of thoracic pattern ; (B), pattern of abdominal segments 8–10, dorsal ; (C), anal appendages, lateral ; (D), the same, dorsal ; (E), penis, lateral ; (F), the same, ventral.

Enallagma somalicum Longfield (Fam. Coenagriidae)

ETHIOPIA : Errer, nr. Gota, 23.v.1948, K. M. Guichard, 4 ♂, 1 ♀.

The type specimens of this species are not in very good condition and I am therefore supplementing the original description as regards colour.

Labrum, anteclypeus and frons bluish. Ground colour of prothorax bluish. Dorsum of synthorax black, with blue antehumeral stripes, the latter extending sideways to the humeral suture, bordered externally with a narrow, blackish stripe. First abdominal segment black above, with a tiny blue spot. The median black stripe on the dorsum of the second segment sometimes broken. The number of postnodal cross-veins is variable, the type series showing 7–8 in the fore wing and 6–7 in the hind wing.

Perilestes bispinus sp. n. (Fam. Perilestidae)

(Text-fig. 3)

BRAZIL: Rio Negro, Thomar, ex McLachlan collection, 2 ♂.

Head with labium pale, labrum shining black, anteclypeus pale blue, postclypeus, frons and vertex shining blue-black. Antennal segments fuscous. Back of head metallic greenish black.

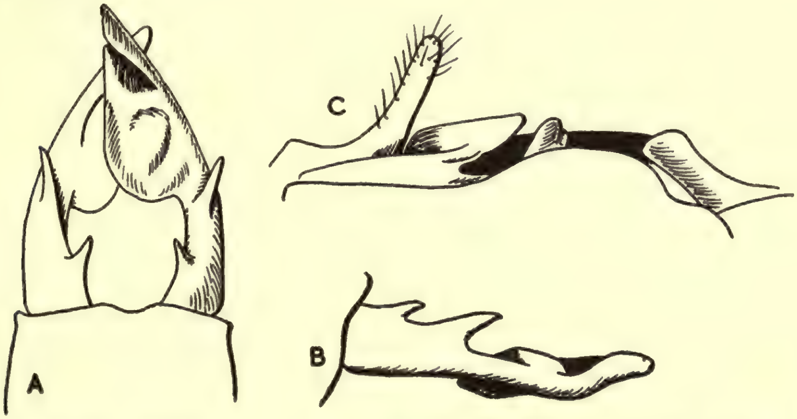

FIG. 3. *Perilestes bispinus* sp. n. ♂. (A), superior anal appendages, dorsal; (B), the same, lateral; (C), accessory genitalia, lateral.

Prothorax pale creamy yellow, anterior margin narrowly fuscous, a fuscous, median, longitudinal band on the median and posterior lobes, broadening posteriorly. Mid-dorsal triangle of mesostigmal lamina fuscous. Mesepisternum chestnut, with a narrow paler line on each side of the dorsal carina. There is a narrow, bluish antehumeral stripe extending along the anterior four-fifths of the humeral suture. Mesepimerum largely chestnut, lower angle pale bluish white. The chestnut stripe of the mesepimerum extends across the upper part of the infraepisternum and continues across the sternum before the second coxae. Metepisternum pale, bluish white, with a narrow brownish stripe along the second lateral suture, across the metinfraepisternum and sternum. Metepimerum pale yellowish. Wings with fuscous veins and dark brown stigma. Legs with coxae yellowish, trochanters and femora pale fuscous, tibiae and tarsi very pale fuscous.

Abdomen with segment 1 pale, apical ring pale fuscous. Segment 2 pale fuscous, darker apically and sides pale yellowish. Segments 3–6 largely pale fuscous, with a narrow whitish basal ring, a darker fuscous apical ring and a paler subapical ring. Segment 7 medium fuscous, with a pale basal ring. Segments 8–10 fuscous, 9 with a bluish, mid-dorsal, basal triangle. Appendages fuscous.

Wings with 13–14 postnodals in fore wing, 11–12 in hind; Riv + v arising at level of first postnodal; IRiii arising, fore wing at level of eighth postnodal, hind wing at seventh; Riii, fore wing at ninth, hind wing at eighth postnodal; IRii in all wings under outer end of stigma. Apex of 1A about level of origin of Riv + v in fore wing, about half a cell basad in hind wing. Three cells between 1A and margin in fore wing, two in hind wing.

Abdominal segment 2 with anterior lamina divided to its base to make two slender, finger-like processes, curving outward and ventrally, somewhat hairy. Posterior hamules broad, plate-like, in type series bent inwards and overlapping.

Superior anal appendages each with two acute spines arising from the upper margin towards the base, the basal and shorter directed obliquely inwards, the distal longer and directed obliquely outwards. The distal half of the appendage has its inner margin produced inwards and downwards in a large, rounded, subtriangular lobe, its apex separated from the apex of the appendage by a deep groove. The upper side of the lobe bears some rounded humps. In side view the appendage is slender, its apex sinuously upcurved.

Abdomen, including appendages, 56 mm., hind wing, 21 mm.

Holotype ♂ and paratype ♂ in British Museum (Nat. Hist.). This very slender species runs out in Kennedy's key to the genus *Perilestes* to *gracillimus* and *attenuatus*. From both it differs in the very short 1A in the hind wing (2 cells long), the form of the anal appendages, with the two basal spines and the large inner lobe, and in the ventrally and outwardly curved branches of the anterior lamina.

Ictinogomphus fraseri sp. n. (Fam. Gomphidae)

(Text-figs. 4–6)

SIERRA LEONE: Firiwa, 9.vi.1912, Port Lokko, 3.v.1912, J. J. Simpson, 2 ♂.

Labium bright yellow. Labrum yellowish green, bordered with black and with a median black spot. Clypeus yellowish green with an interrupted, brownish, transverse band. Frons yellowish green, blackish at base, which colour extends forward at the centre to the crest and overlaps on to the vertical face. Vertex blackish, with the elevated points yellowish. Occiput greenish, the posterior margin elevated at its centre in a rounded lobe and margined with blackish.

Thorax brownish with greenish markings as follows: Mesothoracic collar and the antehumeral stripes, which may be confluent with the collar anteriorly and are dilated dorsally; some small spots on the antealar sinus; juxta-humeral stripe clubbed above; three lateral stripes and a small spot at the summit of the metepimerum. Legs blackish, anterior femora yellowish beneath.

Abdomen black, pattern discoloured, probably yellowish or greenish as follows: Segment 1, an apical transverse band; 2 with a narrow pre-apical band linked to a narrow dorsal stripe; laterally the pre-apical band passes obliquely forward over the oreillets. Segments 3–6 each with a triangular mid-dorsal basal spot, segment 3 also with lateral basal spots and a mid-dorsal pre-apical spot. Segment 7 yellowish, with an apical blackish ring. Segment 8 with a narrow basal ring, 9 with small basal and apical lateral spots, 10 with a lateral spot. Segment 8 with the usual foliation.

Anal appendages mainly blackish but superiors paler in apical two-thirds. Superior appendages more upcurved and relatively shorter than in *regis-alberti*. Inferior upcurved at apex in side view, in ventral view with a U-shaped excision, the arms of the U less tapering than in *regis-alberti*. Accessory genitalia with anterior lamina not strongly projecting in side view. Inner branch of hamule forming a blunt, curved finger in ventral view, not blade-like. Outer branch ovate in side view, its inner margin in ventral view not excavated or hooked nor armed with a dense tuft of hairs.

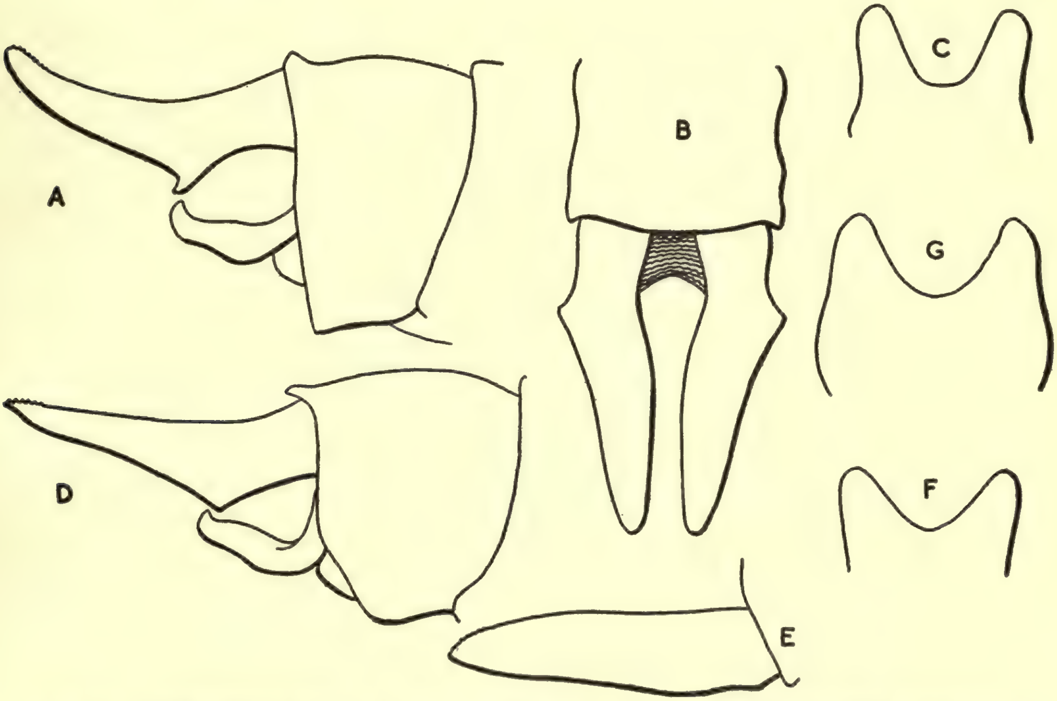

FIG. 4. *Ictinogomphus* spp. ♂. (A–C), *fraseri* sp. n. (A), anal appendages, lateral; (B), the same, dorsal; (C), inferior appendage, ventral; (D–F), *ferox* (Rambur), (D), anal appendages, lateral; (E), right superior appendage, dorsal; (F), inferior appendage, ventral; (G), *regis-alberti* Schouteden, inferior appendage, ventral.

Length of abdomen + appendages, 56 mm., of hind wing, 41 mm.

Holotype ♂ (Port Lokko) and paratype ♂ in British Museum (Nat. Hist.). This species, which I have much pleasure in dedicating to Lt.-Col. F. C. Fraser, M.D., I.M.S., resembles *I. regis-alberti* Schouteden in general appearance and anal appendages. It differs in the large basal marking of the abdominal segments, the more

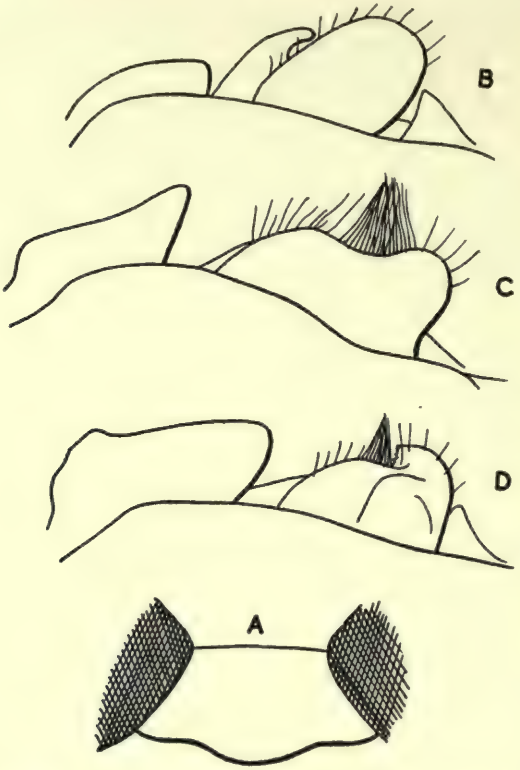

FIG. 5. *Ictinogomphus* spp. ♂. (A–B), *fraseri* sp. n. (A), posterior lobe of occiput, dorsal ; (B), accessory genitalia, lateral ; (C), the same, *regis-alberti* ; (D), the same, *ferox*.

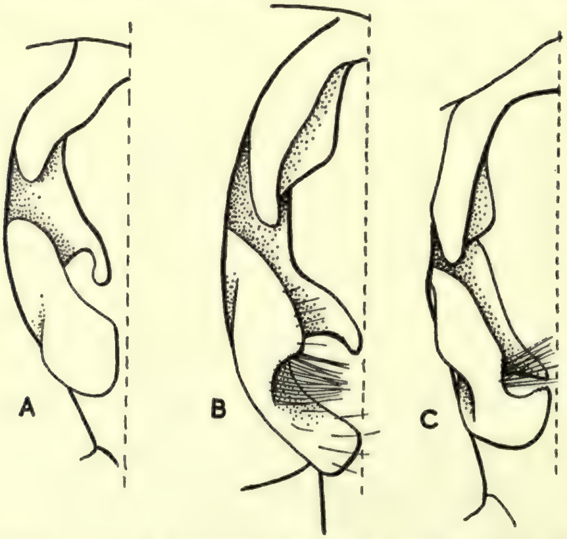

FIG. 6. *Ictinogomphus* spp. ♂ accessory genitalia, ventral. (A), *fraseri* sp. n.; (B), *regis-alberti* ; (C), *ferox*.

produced lobe of the occiput, the more upturned superior appendages and especially in the very different accessory genitalia. In *regis-alberti* the inner branch of the hamule is broad and blade-like and the outer branch has a wide shallow excision of its inner surface, and bears a dense tuft of hairs in the excision. *I. ferox* (Rambur) has even more yellow on the abdominal segments and on the femora, straighter superior appendages, which do not project laterally at the level of the ventral tooth and has the outer branch of the hamule even more excised, its apex forming a blackened tooth, and carrying a tuft of hairs.

Atoconeura biordinata aethiopica ssp. n. (Fam. Libellulidae)

(Text-fig. 7)

ETHIOPIA: Segheria, 25.iii.1948, 2 ♂, 2 ♀; Wondo, iv.1948, 1 ♂; Dilla, iv.1948, 1 ♂, K. M. Guichard.

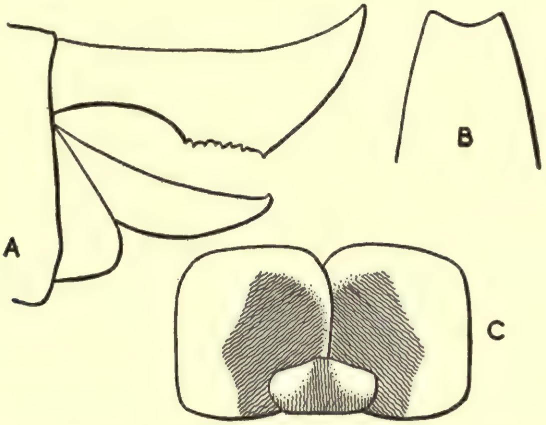

FIG. 7. *Atoconeura biordinata aethiopica* ssp. n. ♂. (A), anal appendages, lateral; (B), inferior appendage, ventral; (C), pattern of labium, ventral.

♂. Labium yellow, with a somewhat pentagonal pattern in black on the lateral lobes, the black pigment not usually reaching the inner margin, median lobe with a blackish basal triangle. Labrum yellow, sometimes with a small blackish spot at centre of the apical margin. Postclypeus and vertical surface of frons whitish, dorsal surface and vertex shining metallic blue, the anterior margin of the metallic colouring almost straight. Sides of frons brownish with a metallic spot.

Dorsum of thorax metallic greenish, slightly obscured by pruinescence, mid-dorsal carina yellowish and there is a yellowish spot on each side before the antealar sinus. Sides of thorax rather discoloured but apparently with the usual yellow and blackish markings. Legs black, posterior surface of anterior femur whitish.

Abdomen almost completely pruinosed, pattern obscured, the apical segments less dilated than in other subspecies. Anal appendages much as in *kenya* Longfield, superior appendages perhaps a little stouter.

Wings with 8–10 antenodals in fore wing, 7–8 in hind wing. Triangle of fore wing divided, a single row of three cells at base of discoidal field, followed by several rows of two cells. Membranule pale grey, with basal third whitish. Pt dark brown.

♀. Labium with the black on the lateral lobes less extensive than in the male. Metallic blue-green on dorsum of frons less extensive. Vertex brownish.

Thorax rather discoloured, dorsum with a slight coppery sheen. Legs blackish, femora marked with whitish on posterior surface of fore legs and on both surfaces of other legs.

Abdomen discoloured, pattern of segments 1–2 obscure. Segments 3–7 yellow from base to transverse carina and with a yellowish band along sides. There are traces of a mid-dorsal, longitudinal, yellowish spot on segment 3 and definite elongate spots on 4–7. Segments 8–9 blackish brown above, with a narrow yellowish lateral stripe. Segment 10 blackish above, with a fine yellowish mid-dorsal line. Ventral segments obscurely yellowish. Cerci black, blunt as in *kenya*, paraprocts shining brownish, sparsely hairy.

Wings slightly smoky, with 9–10 antenodals in fore wing, 7–8 in hind wing. Triangle of fore wing divided, discoidal field beginning with two rows of three cells followed by a number of rows of two cells. Pt dark brown.

Length of abdomen, ♂, 28–30 mm., ♀, 32–33 mm.: hind wing, ♂, 32–34 mm., ♀, 35–36 mm.

Holotype ♂, allotype ♀ (Segheria) and paratypes in British Museum (Nat. Hist.). This subspecies is closely allied to *A. biordinata kenya* Longfield but it differs from it in the scarcely dilated apical segments of the abdomen of the male and the different pattern of the labium.

One might question the wisdom of adding yet another subspecies to *Atoconeura biordinata*, but the fact that there were four males from three localities suggested that the differences mentioned above were not merely individual. The males are very distinctive in their general appearance, with the terminal segments of the abdomen only very slightly dilated. Whilst making comparisons with the other subspecies, a discrepancy was noticed in connection with *A. b. kenya*. In her key, Miss Longfield states that the labrum of *kenya* is all yellow, whereas the holotype ♂ has a broad band of black on the labrum and one of the paratypes has the labrum finely margined with black.

ON SOME TRICHOPTERA FROM S. RHODESIA AND PORTUGUESE EAST AFRICA

By D. E. KIMMINS

MR. ELLIOT PINHEY, of the National Museum of S. Rhodesia, has sent me for identification collections of Trichoptera taken at Victoria Falls in February, July and September 1957 and also a few from Mount Gorongosa, Portuguese East Africa, September 1957. Over twenty species are represented and the collections include examples of seven new species. Five of these are described and figured in this paper and the remaining two I propose to hold back until more material is available.

The Hydroptilidae include a second species of *Catoxyethira*, a genus hitherto only recorded from the Congo. The Hydroptilid fauna of the African mainland is virtually unknown, a mere seventeen species now being known south of the Mediterranean region. To assist in preliminary identification of these tiny Trichoptera, I am giving a key to the genera already recorded, but I have no doubt that further collecting will soon render it out-of-date.

This paper also provides an opportunity to give revised figures of *Chimarra intexta* Mosely, a species which was described from an imperfect specimen.

Mr. Pinhey has generously allowed me to retain the types of the new species, and also such other material as was needed, for the British Museum (Nat. Hist.).

Chimarra fuscipes sp. n. (Philopotamidae)

(Text-fig. 1)

PORT. E. AFRICA : Mt. Gorongosa, ix.1957, E. Pinhey, 1 ♂.

S. AFRICA : Natal, National Park, iii.1932, J. Ogilvie, 1 ♂, Pres. by Imp. Inst. Ent., B.M. 1941–88.

Head and thorax bright reddish yellow, with golden hairs. Antenna fuscous, the basal segment reddish yellow. Palpi fuscous. Legs yellowish, the tarsi and also the anterior tibiae fuscous, spurs fuscous. Abdomen yellowish fuscous, genital segment darker. Wings pale fuscous, with fuscous pubescence. In fore wing, Rs arises only slightly distad to base of thyridial cell. Median cell a little shorter than discoidal. Fork R_4 sessile, fork M_1 shorter than its footstalk. In hind wing fork M_1 also with a long footstalk, fork Cu_{1a} only slightly longer than its footstalk.

♂ GENITALIA. Eighth segment with its tergite forming a hood overhanging the ninth, its sternite somewhat produced at its centre. Ninth segment narrowed to a transverse rib dorsally, its ventral surface with a long, slender, slightly clavate ventral process. Median lobe of tenth segment bifid, each branch rounded apically and with a rounded swelling on the outer margin beyond midway. Four or five sensillae on upper surface. Lateral lobes about as long as median, situated below it and separated by an ovate excision. The outer apical angle is produced in a triangular tooth. Superior appendage small, ear-like. Aedeagus containing two blackish spines. Clasper subtriangular in side view, upper margin concave, lower convex, apex slightly concave and incurved, bearing four inwardly directed teeth.

Length of fore wing, 8 mm.

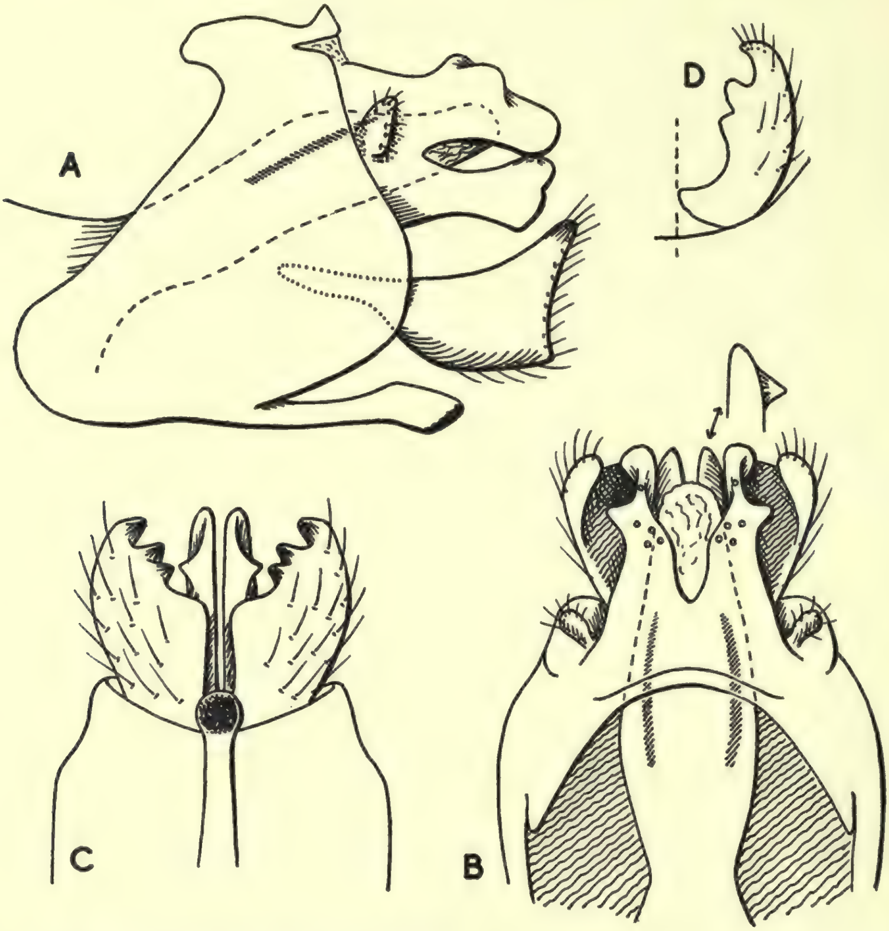

FIG. 1. *Chimarra fuscipes* sp. n. ♂ genitalia. (A), lateral; (B), dorsal; (C), ventral, aedeagus and median lobe of tenth segment omitted; (D), right clasper, from behind.

♂ holotype (Mt. Gorongosa) mounted as microscope preparation, ♂ paratype pinned. This species appears to be related to *C. ruficeps* Ulmer in the general pattern of the ♂ genitalia and in the reddish yellow head and thorax. It differs in the thorax entirely reddish yellow, the bifid median lobe of the tenth segment and the more triangular clasper, whose upper margin is concave and apical margin armed with four inturned teeth.

Chimarra intexta Mosely

(Text-fig. 2)

Amongst some accessions presented by the Commonwealth Institute of Entomology were two males of this species from the type locality (Njala, Sierra Leone). Mosely had only an incomplete specimen of the male, and the additional material confirms the supposition in my recent paper that the type was considerably more damaged than Mosely believed. Not only was one of the lateral lobes of the tenth segment destroyed, but the entire apical portion of the aedeagus was missing. The new material shows that the apex of the aedeagus terminates in two strong spines and within are two smaller spines. The " semi-transparent penis-sheaths " mentioned by Mosely were probably part of the damaged aedeagus. The lower angles of the lateral lobes of the tenth segment turn out more than is shown in the original illustration. I am giving new figures of the ♂ genitalia in side view and of the apex of the aedeagus in dorsal view. *Chimarra cognata* Kimmins resembles *C. intexta* not only in the form of the clasper but in the structure of the aedeagus also.

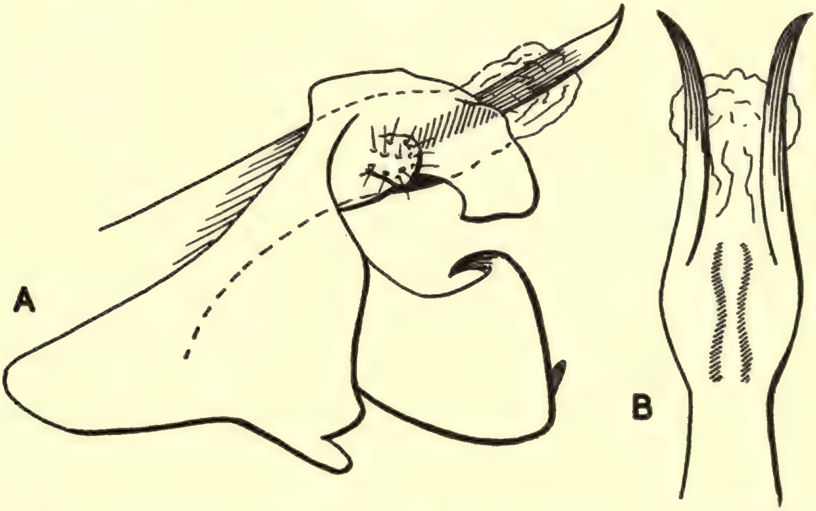

FIG. 2. *Chimarra intexta* Mosely, ♂ genitalia. (A), lateral; (B), apex of aedeagus, dorsal.

Pseudoneureclipsis truncata sp. n. (Polycentropodidae)

(Text-fig. 3).

S. RHODESIA : Victoria Falls, ii.1957, E. Pinhey, 5 ♂.

Insects collected in alcohol. Head dark fuscous, eyes large, globose, antenna ochraceous, palpi pale fuscous. Thorax, wings and legs pale fuscous. Fore wing with fork R_2 about as long as its footstalk, fork R_4 sessile, fork M_1 with a short footstalk, fork M_3 sessile, vein Cu_1 not forked. Median cell extending basally to apex of thyridial cell. In hind wing, forks R_4, M_1 and Cu_{1a} present and stalked.

♂ GENITALIA. Ninth segment narrowed dorsally to a transverse band. Median lobe of tenth segment divided apically into two rounded, setose lobes, which in side view project above the lateral lobes. The latter are separated from the median lobe by a deep, narrow excision, extending almost to the base of the tenth segment, in side view bluntly pointed at apex, in dorsal view terminating in a short finger. Arising from the ventral surface of the tenth segment are two claw-like paraproctal processes, directed caudad, from above straight, hooked outwards at apex. Aedeagus slender, cylindrical, apical membrane clothed with minute spinules ; two spiniform

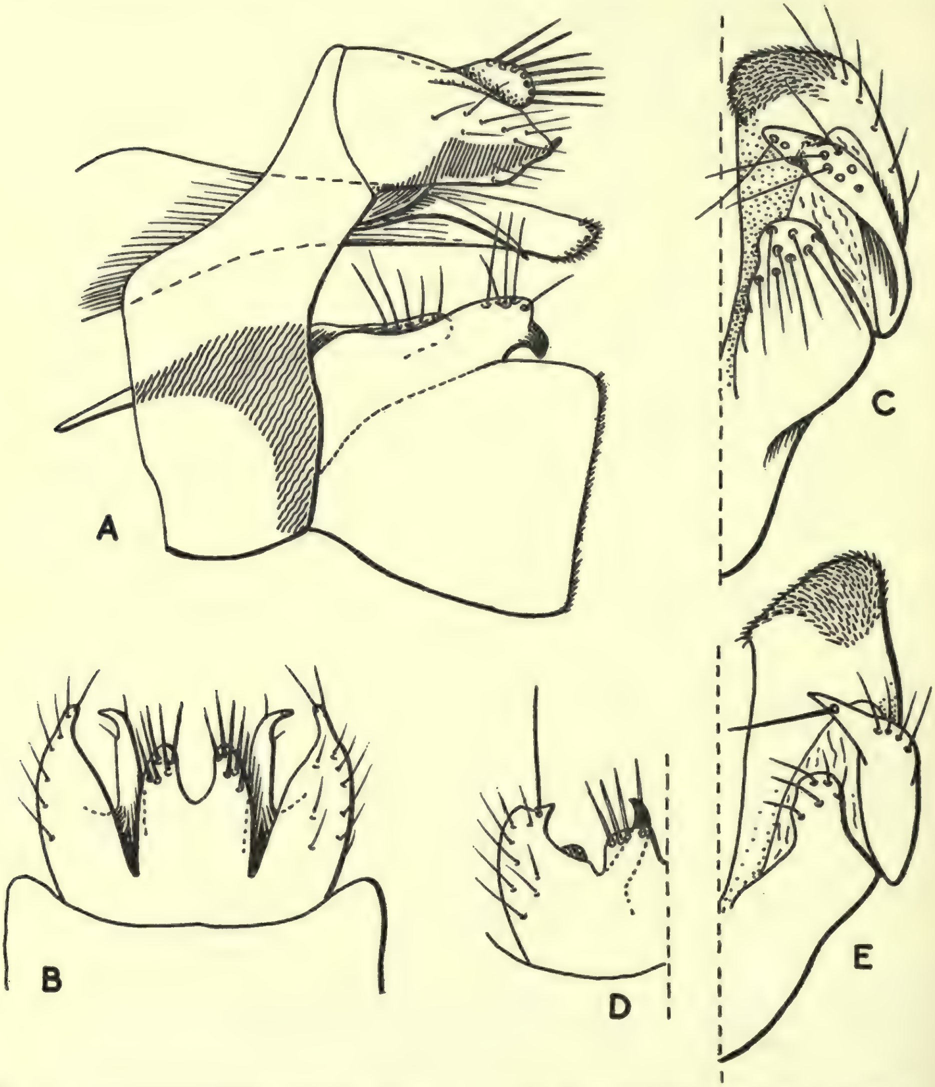

FIG. 3. *Pseudoneureclipsis truncata* sp. n. (A–C) and *Ps. mlangensis* Mosely, paratype, (D–E), ♂ genitalia. (A), lateral ; (B), tenth segment, dorsal ; (C), left clasper, dorsal ; (D), right half of tenth segment, dorsal ; (E), left clasper, dorsal.

parameres. Claspers fused basally, from side quadrate, apical margin truncate, clothed with microscopic setae. There is an upper branch (? second segment) fused to the dorsal margin of the clasper, abruptly narrowed and hooked inwards apically, apex from above rounded. Above the base of the claspers are two rounded, setose lobes.

Length of fore wing, 5 mm.

♂ holotype mounted as microscope preparation, ♂ paratypes in British Museum (Nat. Hist.) and National Museum of S. Rhodesia, Bulawayo. This species is closely related to *Ps. mlangensis* Mosely, but differs in details of ♂ genitalia. The tenth segment is more deeply excised and the lateral lobes are narrower in dorsal view. Branches of the median lobe narrower and more rounded apically in dorsal view. Paraproctal processes less curved. Clasper in side view with a truncate apical margin, relatively shorter. Upper branch less acute in dorsal view.

Family HYDROPTILIDAE

In this family, the " Micros " of the Trichoptera, fourteen species have so far been recorded from the African mainland, south of the Mediterranean region. There must be a vast number of species still to be found, since almost every collection brings in a few new species and this from the Victoria Falls is no exception, providing yet three more. In the hope that it may encourage collectors to pay more attention to these tiny insects, I give below a provisional key to the Hydroptilid genera already recorded from the Mainland.

1.	Ocelli present (sometimes inconspicuous)	2
–	Ocelli absent	5
2.	Tibial spurs 0.3.4	3
–	Tibial spurs 1.2.4	*Afritrichia* Mosely
3.	Wings tapering to long, more or less parallel-sided apices. Venation reduced, no apical forks	*Argyrobothrus* Barnard
–	At least the fore wing moderately broad, not terminating in a long narrow apex. At least fork M_1 present in both wings	4
4.	Only fork M_1 in both wings (Rs in fore wing forked to make veins R_{2+3} and R_{4+5})	*Catoxyethira* Ulmer (*partim*)
–	Forks R_2, R_4 and M_1 in fore wing, R_4, M_1 and Cu_{1a} in hind wing	*Ugandatrichia* Mosely
5.	Tibial spurs 0.2.4	*Hydroptila* Dalman
–	Tibial spurs 0.3.4	6
6.	Fore wing with forks R_4 and M_1; hind wing with fork M_1 only	*Catoxyethira* Ulmer (*partim*)
–	Fore wing with forks R_2, R_4 and M_1; hind wing with fork R_4 only	*Orthotrichia* Eaton

? *Argyrobothrus* sp.

Numerous females from Victoria Falls, February 1957 are referred here with some doubt, pending the discovery of males.

Hydroptila africana sp. n.

(Text-fig. 4)

S. RHODESIA : Victoria Falls, ii. 1957, E. Pinhey, 1 ♂.

Specimen collected in alcohol, much rubbed and rather bleached. Antenna with thirty segments. Scent organ small and obscure.

♂ GENITALIA. A pointed process to the seventh sternite. Ninth segment narrowed above and below, lateral apical margins produced in short lobes, which are rounded in side view, lower margin incurved and triangular from beneath. Tenth segment forming an elongate, quadrate hood, lateral margins more sclerotized than centre, apex slightly excised. Aedeagus of the normal *Hydroptila* pattern, titillator broad at its base, tapering to a slender apex. Claspers fused basally, from the side somewhat clavate, apex shallowly concave. From beneath, the lower apical angle is curved outward.

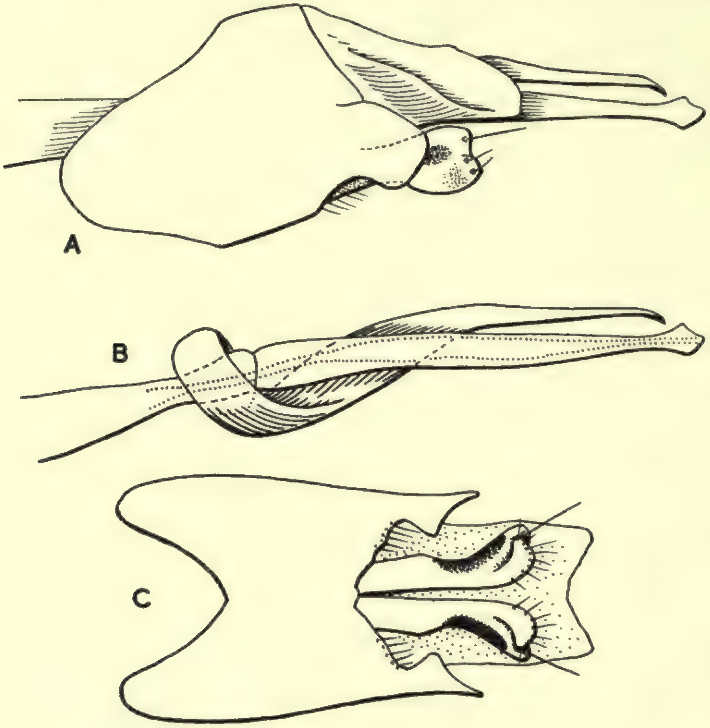

FIG. 4. *Hydroptila africana* sp. n. ♂ genitalia. (A), lateral ; (B), aedeagus, lateral ; (C), ventral, aedeagus omitted.

Length of fore wing, 1·8 mm.

♂ holotype mounted as microscope preparations. This species may be distinguished from the other two species already described from S. and E. Africa (*cruciata* Ulmer and *capensis* Barnard) by the absence of the paired sinuous spines (" titillators " of Barnard), which are a conspicuous feature of these two species, and by the shorter claspers.

Hydroptila sp.

Two different species, represented by females only, were taken at the same time as the foregoing male and in consequence no attempt has been made to associate either female with *H. africana*. One of the species has two very distinctive blackish spots on the dorsum of the ninth segment.

Catoxyethira pinheyi sp. n.

(Text-fig. 5)

S. RHODESIA : Victoria Falls, ii.1957, E. Pinhey, 2 ♂.

(In 80% alcohol.) Head pale fuscous, with fuscous and greyish hairs. Antenna with eighteen segments, very pale fuscous, with two bands of fuscous pubescence, a broad one about midway and a narrower one towards the apex. Ocelli present. Legs pale ochraceous. Fore wing with dense fuscous pubescence. Venation much as in the typical species, *C. fasciata* Ulmer.

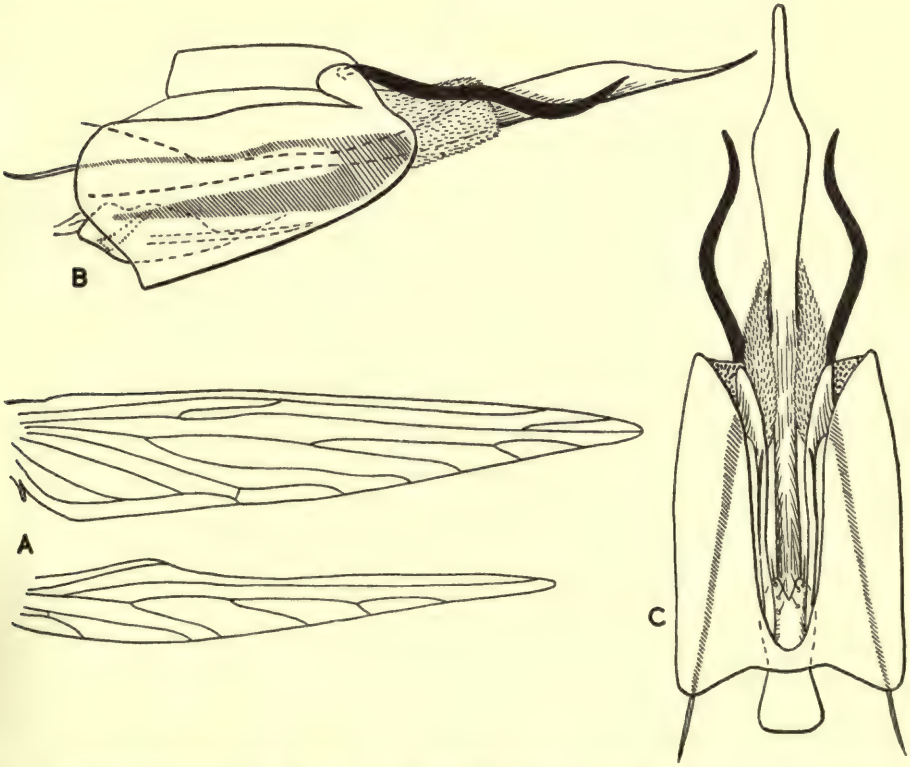

FIG. 5. *Catoxyethira pinheyi* sp. n. ♂. (A), Wing venation ; (B), eighth to tenth segments, lateral ; (C), the same, ventral.

♂ GENITALIA. Eighth sternite elongate, excised almost to its base in ventral view. From the side, the upper apical angle is produced upwards in a cup-shaped lobe, from which arises a long, stout, sinuous spine. Ninth segment much reduced and withdrawn within the eighth. From the side, and from beneath, in a cleared preparation, it is very narrow and U-shaped, the upper arm of the U slender and spiniform. Tenth segment membranous and clothed with microscopic setae, forming a hood over the stem of the aedeagus and projecting beyond the eighth segment. Aedeagus long and slender, tapering to a fine pointed apex. Claspers rather obscure, apparently fused to form a plate with a bilobed apex, each arm bearing one or two setae. On each side of this plate there appears to be a slender, acute spine.

Length of fore wing, 1·4 mm.

♂ holotype mounted as microscope preparation, ♂ paratype in National Museum of S. Rhodesia. This species differs from the generic diagnosis in possessing ocelli, which are however not conspicuous. It further differs from the characters given in Barnard's key to the S. African Hydroptilidae in possessing an anal lobe to the fore wing. It agrees with the generic diagnosis in its spur formula, the general pattern of the venation and in the strong spines of the eighth sternite of the male. I have therefore decided to retain it in the genus *Catoxyethira*. It differs from *C. fasciata* in its much larger eighth segment and less digitate claspers.

Orthotrichia spinicauda sp. n.

(Text-figs. 6–7)

S. RHODESIA : Victoria Falls, ii., ix. 1957, E. Pinhey, 6 ♂, 7 ♀.

(In 80% alcohol.) Head and thorax pale fuscous, with fuscous and greyish hairs. Antennae dull luteous, with sparse fuscous pubescence, about thirty-segmented (♂). Fore wing with fuscous pubescence, with scattered greyish patches. Venation as in *O. sanya* Mosely, i.e., with R_3 in fore wing arising from the stem of R_{4+5}. A dense patch of black scales in the costal area at the base of fore wing in ♂. Abdomen yellowish, apex fuscous, with short processes to sixth and seventh sternites.

♂ GENITALIA. Completely asymmetric, as is usual in *Orthotrichia*. Ninth segment largely withdrawn into eighth, with deep apical and basal lateral excisions. From the right hand side, the lower part of the ninth segment is produced in a long slender spine, the lower basal margin forming a transparent lobe fringed with a number of strong setae. From the left side, the lower part of the ninth segment forms a vertical plate, its ventral margin sinuate and carrying a tuft of setae, apex curved inward and terminating in an upwardly directed hook, with a strong seta at its base. Upper part of ninth segment fused with the tenth segment, forming an elongate, lightly sclerotized hood, with a laterally directed hook near its apex, and with three spines on the right side. The innermost is hooked downwards, the next is directed tailward and towards its apex is curved inwards over the dorsum, and the third, which is shorter and straight, arises from the lower margin. Aedeagus long, slender, with a spiral tube and a loosely attached, spiniform paramere (both omitted from the figures). Below the aedeagus, and probably attached to the basal angles of the

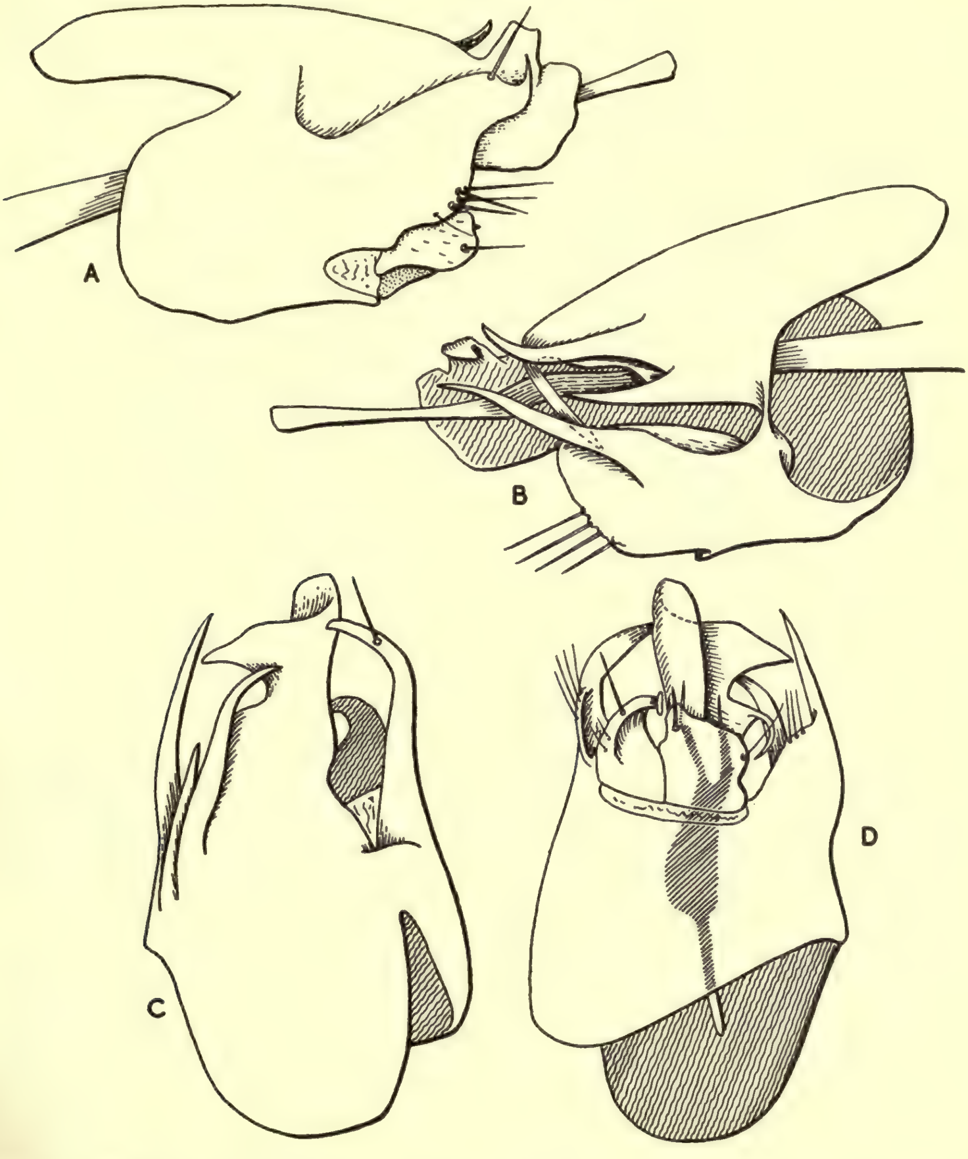

FIG. 6. *Orthotrichia spinicauda* sp. n. ♂ genitalia. (A), left, lateral; (B), right, lateral; (C), dorsal, aedeagus omitted; (D), ventral, aedeagus omitted.

dorsal hood, is an elongate, semi-transparent structure, with a slender, basal apodeme and a bifid apex, each branch terminating in a seta. Claspers fused to form an asymmetric plate set within an excision of the ninth sternite, the plate excised almost to its base, the left clasper terminating in a sinuous finger.

♀ GENITALIA. A short, pointed ventral process on apical margin of sixth sternite; apical margin of seventh sternite very slightly produced at its centre. Eighth segment forming a complete ring, apical margin of upper three-fourths irregular and fringed with setae. Ventral margin produced in an asymmetric subgenital plate, projecting beneath the ninth segment and tapering to a rounded apex. There is an opening on the ventral surface leading to a duct. Ninth segment lightly sclerotized above, membranous beneath. Tenth segment forming a rounded lobe with two short, rod-like cerci.

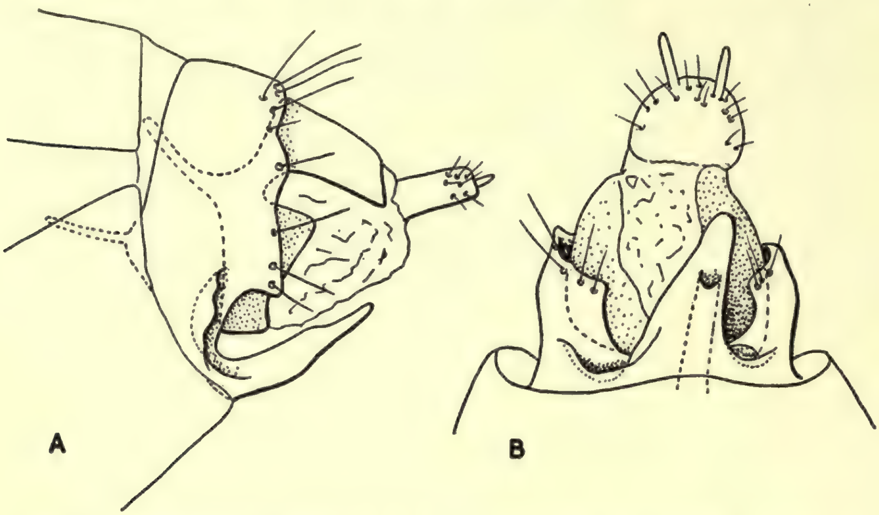

FIG. 7. *Orthotrichia spinicauda* sp. n. ♀ genitalia. (A), lateral; (B), ventral.

Length of fore wing, ♂, 1·9 mm.

♂ holotype, ♀ allotype (ii.57, mounted as microscope preparations), paratypes in British Museum (Nat. Hist.) and National Museum of S. Rhodesia, Bulawayo. This species belongs to the *sanya* group and is related to *O. straeleni* Jacquemart. It differs in the spiniform processes of the ninth-tenth segments and the less completely fused claspers.

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LT.-COL. J. N. ELIOT.

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ENTOMOLOGY Vol. 7 No. 8
LONDON: 1959

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BY

LT.-COL. J. N. ELIOT, xng.

Pp. 369–391 ; *Plate* 10 ; 7 *Text-figures*

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NEW OR LITTLE KNOWN BUTTERFLIES FROM MALAYA

By Lt.-Col. J. N. ELIOT, F.R.E.S.

THE present paper is an attempt to bring up to date the Synonymic List of Malayan Butterflies in Corbet's & Pendlebury's *The Butterflies of the Malay Peninsula*, 2nd Edition, 1956.

Certain additions and amendments to the Malayan list have already been, or are being, published in the following papers :

Howarth, T. G. (1956). A new species of butterfly of the genus *Niphanda* (Lep. Lycaenidae) from Malaya. *Entom.* **89** : 161–162.

Evans, W. H. (1956). Revisional Notes on the Hesperiidae of Europe, Asia and Australia. *Ann. Mag. nat. Hist.* **12** (*IX*) : 749–752.

—— (1957). A Revision of the *Arhopala* group of Oriental Lycaenidae. *Bull. Brit. Mus.* (*nat. Hist.*) Entomology **5** (3) : 85–141.

Eliot, J. N. (1956). New and little known Rhopalocera from the Oriental Region. *Bull. Raffles Mus.* **27** : 32–37.

—— (1957). Notes on the genus *Poritia* Moore. *Entom.* **90** : 70–74.

—— (1958). An analysis of the genus *Miletus* (Hübner). *Bull. Raffles Mus.* **29** (in press).

Cowan, C. F. Some new and interesting butterflies recorded from Malaya. *Malayan Nat. J.* (in press).

The further records which follow result partly from an examination of the collections of Messrs. G. C. Stubbs, J. A. Hislop and C. K. Kemp, and I am most grateful to these gentlemen for allowing me to extract interesting specimens for presentation to the British Museum (Natural History)—referred to hereafter as B.M. I have not attempted to include any butterflies from Tioman Island, whence Mr. Stubbs has recently been amassing a large and most interesting collection which certainly contains a few species and many subspecies new to the Malayan list.

I am also grateful to the authorities of the B.M. for facilities, including the loan of material, and to Major C. F. Cowan, R.A. for advice and taking the photographs in the plate.

Corbet & Pendlebury listed 898 species reliably recorded from Malaya. The present additions (including those recorded in the papers above) bring the total to 947. It is certain that many more species, especially among the Lycaenidae and Hesperiidae, still await discovery.

The types of all new species, subspecies and forms described below have been deposited in the B.M.

The following abbreviations have been used: F = fore wing, H = hind wing, Up = upperside, Un = underside, V = vein.

PAPILIONIDAE

1. ***Trogonoptera brookiana trogon*** (Voll., 1860)

I have recently been shown a series of both sexes taken in Western Trengganu by Mr. Leonard of the Game Department. This Sumatran subsp. also occurs in Johore. The subsp. *albescens* Rothsch., 1895, does not appear to have been taken anywhere away from the central range of mountains.

2. ***Chilasa paradoxa aenigma*** ♀ f. ***leucothoides*** (Honr., 1891) (= *penomimus* (Mart., 1895))

This form, which is a passable mimic of *Euploea eyndhovii* Feld., has already been recorded from Singapore by Morrell (*Malayan Nat. J.* **11** (4) : 96). I have seen a further example from the mainland: Trengganu, Jerangau, 16.iii.1956 (*G. C. Stubbs*).

SATYRIDAE

3. ***Ypthima pandocus tahanensis*** Pend., 1933

This insect, in its small size and reddish-brown colour of the striations of the Un, shows a remarkable similarity to *Ypthima nigricans* Snell. an apparently distinct species occurring in Java and Bali and also in Celebes (subsp. *ancus* Fruh.). Examination of the ♂ genitalia of a small number of *nigricans* from Bali and Celebes and 1 ♂ *tahanensis* kindly given me by Mr. J. A. Hislop reveal further similarities—namely all have a slightly thinner and longer uncus and broader clasp than the corresponding *pandocus* subspecies.

I have recently heard from Mr. G. C. Stubbs, who writes: " I have a short series of *tahanensis* collected on 28 and 29 May this year. There are 8 specimens of normal *tahanensis*, and in addition there are 3 quite normal but rather small *Y. pandocus corticaria* from the same locality, the padang area, about 5500 ft, on Gunong Tahan. There are no intermediates. Another difference not mentioned in Cbt. & Pend. is the different shape of the wings. This is very noticeable; *pandocus* has round wings, and those of *tahanensis* are quite angular in comparison. This, I think, confirms your suggestion that *tahanensis* should be referred to *nigricans*, or at least not to *pandocus*."

In the only two examples of *tahanensis* available to me the apex F is more acute, the tornus more obtuse and the termen straighter than in *corticaria*. These differences are, however, hardly noticeable in examples of *pandocus* and *nigricans* from Java and Celebes, where both species have more the wing shape of *tahanensis*. In the circumstances I think it is reasonable to detach *tahanensis* from *pandocus* and to refer it as a subsp. to *nigricans*.

It may be significant that the only other apparently isolated mountain population of *pandocus* known to me, namely that occurring at the summit of Mt. Ophir in Johore, is distinguished by very large size though not otherwise differing from *corticaria*.

NYMPHALIDAE

4. *Argyreus hyperbius sumatrensis* (Fruh., 1912)

♂ Pahang, Tanah Rata, 4,500 ft., 4.vii.1957 (*J. N. Eliot*). New to Malaya. I believe that another example of this species was caught in the Cameron Highlands by Mr. M. J. V. Miller at an earlier date.

5. *Chersonesia nicévillei* Mart., 1895

The record and fig. of " *C. intermedia* " in Cbt. & Pend., 1956 (Note 20 on p. 477, and pl. 41, fig. 109) are in fact of this very rare species, which is not otherwise known to occur outside Sumatra.

6. *Chersonesia intermedia intermedia* Mart., 1895

(Pl. 10, fig. 5)

Cbt. & Pend. failed to recognize this species, which is by no means rare in Malaya. Superficially it is rather similar to the common *C. rahria* Mre., from which it differs in the following respects : it is smaller (F usually 15–19 mm. against 19–22 mm.) ; on Up the sub-basal bands are broader and contrast more strongly with the ground colour ; at the apex UpF there is no diffuse dark line, as in *rahria*, running from the submarginal dark line at a point about 2 mm. below the apex almost to a point on the costa about the same distance from the apex. The ♂ genitalia show considerable differences (see Text-fig. 1).

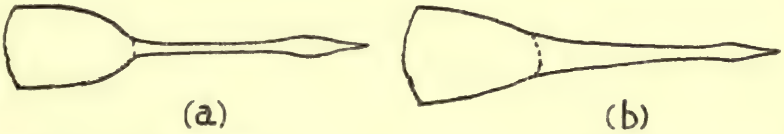

FIG. 1. Uncus and tegumen (dorsal view) of : (a) *Chersonesia intermedia* Mart. (Malaya), (b) *C. rahria* (Mre.) (Malaya).

C. intermedia, both in its nominotypical subsp. and the Burmese subsp. *rahrioides* Mre., is remarkable for the frequency with which pale dwarf specimens, with F as little as 12 mm., occur.

7. *Neptis sandaka* (Btlr., 1892)

The oldest name for the " form " of *Neptis hordonia* (Stoll) with the " light male mark " (see Cbt. & Pend., p. 220) is *sandaka* Btlr. It is undoubtedly a good species, which differs from *hordonia* in the following additional respects : the ground colour is deeper orange ; on UpF the submarginal orange line is conspicuous and much wider than the grey line internal to it (this grey line being always prominent in *hordonia*) ; the cilia in spaces 4, 5, 7 and 8 on F are not prominently chequered as in *hordonia*.

Butler's original description of *sandaka* (type in B.M.) is misleading, as he compares it only with *N. paraka* Btlr.

N. sandaka and *N. hordonia* occur equally commonly in Malaya, and Malayan examples of the former do not differ from examples from the type locality of Sandakan, N. Borneo. The fig. of "*hordonia*" in Cbt. & Pend. (pl. 41, fig. 110) is in fact of *sandaka*.

8. ***Neptis heliodore*** (F.) complex

(Pl. 10, figs. 3, 4)

This complex comprises two species, whose relationship recalls that of *N. hordonia* and *N. sandaka*.

Roepke (*Rhop. Javanica*, **3** : 300 and pl. 31) has drawn attention to most of the superficial and genitalia differences between the two species, viz. the rarer species has a lighter speculum ("male mark") on UpH, has the submarginal orange spot in space 3 on F approximately the same width as those above and below it and, in the ♂ genitalia, has a different cornutus (the "radula" of Roepke) comprising a few finger-like spines surmounted by a bunch of much shorter spines. Roepke called the rarer species *Neptis siaka* Mre., 1881. However the type of *siaka* is in the B.M., and is a perfectly normal Sumatran example of *N. heliodore dorelia* Btlr. I therefore propose the name *roepkei* NOM. N. pro *siaka* Rpke. nec Mre. for the form of the rarer species occurring in Java.

A distinct subsp. of *N. roepkei* occurs in Burma:

N. roepkei ioannis subsp. n.

In both sexes differs from Javanese *roepkei* in having wider orange markings; in particular the submarginal orange band on UpH, which is obscure and sullied in the Javanese form, is conspicuous and clear orange. On UnH the dark discal band is narrow, 1·5 mm. wide or less, whereas in the Javanese form this band is almost twice as broad and considerably darker.

Holotype ♂ and allotype ♀ S. Burma, Victoria Point, ii.1922 (ex *Archbald* coll.). A series in B.M. from S. Burma and Siam.

Malayan examples, though showing a slight approach to the Javanese form, hardly differ enough from Burmese examples to merit a further subspecific name. I have seen only 1 ♂ of *roepkei* from Borneo, which is intermediate between the Burmese and Javanese forms. I have seen no Sumatran examples of *roepkei*, but it is certain to occur there.

N. roepkei is probably not rare in Malaya, though usually overlooked through its resemblance to the much commoner *N. heliodore*. I have taken it in Singapore as well as on the mainland. Malayan examples of the two species are not hard to distinguish. In addition to the differences already pointed out, in *roepkei* the ground colour is deeper orange; the discal band on UnH comprises a pale brownish fascia overlaid near its outer edge by a single comparatively broad dark line, whereas in *heliodore dorelia* the pale fascia is both inwardly and outwardly defined by narrower dark lines, the inner of which is lighter, well defined near the costa but fading out as it approaches the dorsum (see Pl. 10, figs. 3, 4). The latter character, however, does not apply to nominotypical *heliodore* from the Langkawi Is., in which the inner dark line is absent.

9. *Neptis nandina gononata* Btlr., 1877

Most modern authors have misidentified *N. nandina* Mre., 1857, the type of which (see *Lep. Ind.* **3** : 235) is the ♂ figured in Hsf. & Mre. (*Cat. Lep. E. I. Co.*, pl. IVa, fig. 7). *N. nandina* Mre., *N. yerburii* Btlr. and *N. mahendra* Mre. all have similar ♂ genitalia characterized by having a small sharply-elbowed hook at the distal end of the clasp (see Text-fig. 2), and together form a natural group. The species erroneously dealt with as "*nandina*" by Cbt. & Pend. (see below) belong to the *N. hylas* (L.) group and have a much larger evenly curved hook at the end of the clasp.

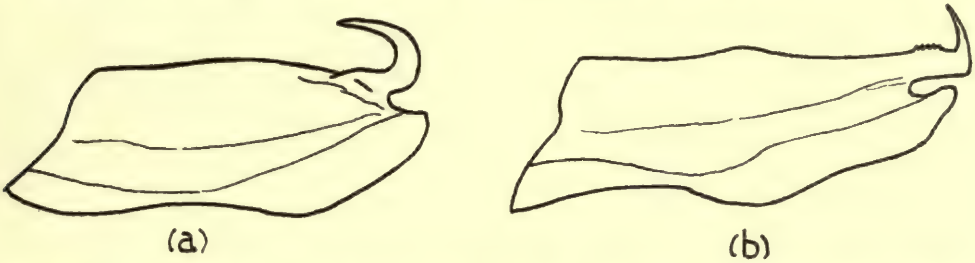

FIG. 2.—Right clasp of: (a) *Neptis clinioides* Nic. (Malaya), (b) *N. nandina gononata* Btlr. (Malaya).

10. *Neptis clinia* Mre., 1872 *leuconata* Btlr., 1877

(Pl. 10, fig. 2)

Neptis clinioides Nic., 1894

(Pl. 10, fig. 1)

Cbt. & Pend. confused these two species under "*nandina*". They differ from each other in the following respects: on F the triangular white spot beyond the cell streak is longer in *leuconata*; the cilia in space 6 on F are black in both sexes of *clinioides*, whereas in the ♀ of *leuconata* they contain a prominent white patch (sometimes faintly discernible in the ♂ also); in *leuconata* the extreme base of the costa on UnF is orange-brown; on H the white discal band is evenly wide and extends into the base of space 3 in *leuconata*, whereas in *clinioides* it tapers markedly towards the dorsum and seldom enters the base of space 3.

In contrast to *nandina*, which exhibits marked geographical variation, *clinia* and *clinioides* are rather constant throughout their range. The latter species is confined to Malaysia, and examples from Malaya, Borneo, Java and Bali do not differ sufficiently from examples from the type locality of NE. Sumatra to merit subspecific rank. In Malaya *N. clinioides* is common in the hill stations between 2,000 ft. and 5,000 ft. *N. clinia* prefers lower elevations and I have not caught it above 2,000 ft. Langkawi examples show an approach to the Indian subsp. *susruta* Mre. in having some of the white markings on Up slightly sullied.

11. ***Neptis harita*** Mre., 1874

Corbet (*Proc. R. ent. Soc. Lond.* B, **6** (5) : 101–102) at one time considered *harita* to be distinct from *N. vikasi* Hsf., but in Cbt. & Pend. no mention is made of *harita*, presumably because the two were regarded as conspecific.

In my view *harita* is undoubtedly a distinct species. There is never the slightest difficulty in distinguishing it from *vikasi*, and the area of overlap—from Indo-China, Siam and S. Burma to Borneo—is far too great for them to be considered overlapping subspecies. The main superficial differences are as follows : in *harita* all the pale markings are narrower and more obscure ; the post-discal spot in space 2 on UpF is crescentic in *harita*, more or less quadrate in *vikasi* ; on UpH the ♂ speculum is much larger in *harita* ; on UpH and particularly on UnH the dark area between the post-discal and submarginal pale bands is narrow and broken up into catenulate spots between the veins in *harita*, but is broader and entire in *vikasi* ; on Un the pale markings are more prominently washed with purplish-pink in *harita* ; in the ♂ genitalia *harita* has an unusually large cornutus.

N. harita and *N. vikasi omeroda* Mre. are equally common in Malaya.

12. ***Parathyma ranga malaya*** (Pend., 1933)

The key characters, given in Cbt. & Pend., p. 222, for distinguishing *P. ranga* from *P. abiasa* are applicable to the Indian forms of *ranga*, but not to its Malayan form. Superficially *P. ranga malaya* and *P. abiasa clerica* (Btlr.) are very similar, but they can be separated by *malaya* having white dots on the abdomen. The original description of *malaya* sets out many other minor points of difference (*J. F.M.S. Mus.* **17** : 395–396).

Both species are most often seen on exposed hill-tops, though both also occur rarely at low elevations.

LYCAENIDAE

13. ***Allotinus fallax michaelis*** subsp. n.

(Pl. 10, figs. 8, 9)

♂ nearest to the Bornean subsp. *audax* H. H. Drc., 1895, from which it differs, in having a unicolorous UpH (in *vudax* the UpH is always paler and usually whitish on the disc).

♀ differs from *audax* ♀ in having a narrower and more clearly defined white patch on UpH.

Holotype ♂ Selangor, Ginting Sempak, 1,500 ft., 20.i.1957 (*J. N. Eliot*), allotype ♀ Pahang, above Ginting Sempak, 2,800 ft., 14.vii.1957 (*J. N. Eliot*).

14. ***Allotinus davidis*** sp. n.

(Pl. 10, figs. 6, 7)

Nearest to *A. nivalis substrigosa* (Mre., 1884), which it resembles in size and in having the discal spot mid-space 7 on UnH darkened.

♂ differs from *substrigosa* in the following respects: on Up the ground colour is more reddish-brown; on UpF the swollen portion of V 4 extends for one-quarter of the total length of the V compared with more than one-third in *substrigosa*; on Un the ground colour is pale buff, not white as in *substrigosa*; on UnF there is no prominent white dash at the apex; on UnH the postdiscal spot in space 7 is narrowly darkened inwardly, this spot never being darkened at all in *substrigosa*. The genitalia also differ, notably in the clasp which tapers to a fine incurved point (see Text-fig. 3).

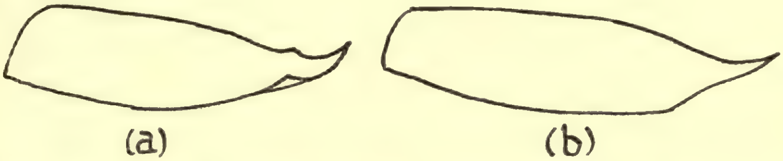

FIG. 3.—Right clasp of: (a) *Allotinus nivalis substrigosa* (Mre.) (Malaya), (b) *A. davidis* sp. n. (Malaya).

♀ apart from the swelling of V 4 on UpF, differs from *substrigosa* ♀ in the same respects as the ♂.

Holotype ♂ and allotype ♀ Singapore, 17–18.vi.1953 (*J. N. Eliot*). ♀ paratype from S. Johore in my coll.

15. ***Niphanda marcia*** (Fawc., 1904)

♂ Pahang, Fraser's Hill, Bukit Kemalau, 4,000 ft., 17.viii.1957 (*J. N. Eliot*). New to Malaya.

N. tessellata Mre. and *N. stubbsi* Howarth occur on the same hill-top. The antennal club of *N. marcia* is cylindrical, of *N. tessellata* flattened, and there are several other points of difference between these two purple species.

16. ***Curetis freda*** sp. n.

(Pl. 10, fig. 10)

Two perfectly distinct and superficially easily recognized species have hitherto been confused under *C. insularis* Hsf., 1829. I am at a loss to understand how the second species has escaped detection for so long.

♂ differs from *insularis* in having the black border on UpF evenly rounded and inwardly rather diffuse, not, or hardly, running in along the veins (in *insularis* the inner edge is more sharply defined, is angled just beyond end-cell and, in examples from Malaya, Sumatra and Borneo (subsp. *pseudoinsularis* Fruh., 1908

= *tagalina* Fruh., 1908), runs inwards for 1–2 mm. along Vs 1, 2 and 3). On UnH the series of discal striae are continuous from V 8 to V 1b in *freda*, whereas in *insularis* the stria in space 1b is always shifted in about 1–1·5 mm. Genitalia differ as in Text-fig. 4.

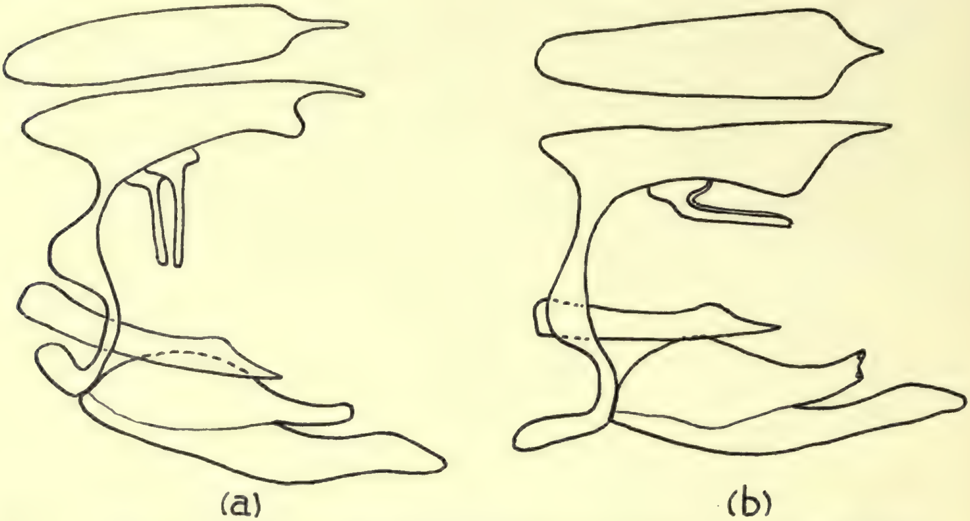

FIG. 4. Dorsal view of uncus and tegumen (above) and lateral view of genitalia (left clasp removed) of: (a) *Curetis freda* sp. n. (Malaya), (b) *C. insularis pseudoinsularis* Fruh, (Malaya).

♀ on Up resembles *insularis* ♀, from which it differs on Un exactly as in the ♂. Holotype ♂ Perak, vii–viii.1895 (*Lakatt & Pamboo*). Allotype ♀ Malay Peninsula (ex *Adams* coll.).

B.M. has a very large series of *insularis* from S. Burma, Malaya, Sumatra, Borneo, Banka and Java. The series of *freda* is smaller, and there are no examples from S. Burma, Banka and Java. In my experience *freda* is commoner in Malaya than *insularis*.

17. ***Amblypodia anita anita*** Hew., 1862

♂ Pahang, Kuala Rompin, 4.viii.1953 (*J. A. Hislop*). Hitherto known in Malaya only from Perlis.

18. ***Narathura varro selama*** subsp. n.

♀ Up rather bright sky blue, not bluish-white as in subsp. *varro* (Fruh., 1913) from Burma. On UpF the black border is 2 mm. wide at V 1, widening to 3 mm. at V 6, whence it extends along the costa to the base with a tooth running into the cell along the dcv. There are two small black spots contiguous with the black border in spaces 4 and 5. On UpH the black border is 2 mm. wide throughout and inwardly rather diffuse. On Un the ground colour is hair-brown; the markings, arranged as in *varro*, are large, hardly darker than the ground colour and prominently outlined whitish. At mid-termen F and H there is a slight reddish-brown suffusion. There is no whitish streak in space 6 on UnH as in subsp. *varro*. F 21.5 mm.

♂ Up similar to *varro* ♂. Un similar to the ♀. F 19·5 mm.

Holotype ♀ Perak, Ulu Selama, 1,000 ft., 19.i.1957 (*J. A. Hislop*). Allotype ♂ Selangor, Ulu Langat, 9.iv.1933 (*G. C. Stubbs*).

As the ♂ is in very worn condition I have made the ♀ the holotype. Mr. Hislop tells me that he found it sitting freshly emerged in a rhinoceros's footprint which he had bent down to measure, and caught it in his fingers !

N. varro and *N. johoreana* Cbt. both have a rather short H tail (about 2 mm. long). The other members of the *camdeo* (Mre.) group all have a tail twice as long.

19. ***Narathura athada athada*** (Stgr., 1889)

Three ♂ from Pulo Tenggol, a small island off the coast of Trengganu, taken by Mr. G. C. Stubbs, have the Un purple-washed as in the Burmese subsp. *apha* (Nic.), though hardly differing from normal Malayan specimens on Up.

20. ***Narathura azinis azinis*** (Nic., 1896)

♀ Pahang, Gunong Batu Brinchang, 6,600 ft., 7.vii.1957 (*J. N. Eliot*). New to Malaya.

A strong wind was blowing when this specimen was captured, and it had probably been wind-borne above its normal altitude. A ♀ *Aurea trogon* caught nearby at the same time must also have been wind-borne.

21. ***Narathura aurelia*** (Evans, 1925)

♂ Perlis, Kangar, 22.ix.1957 (*J. N. Eliot*). New to Malaya.

The black border on UpF is slightly narrower than in Burmese examples.

22. ***Narathura pseudomuta*** (Stgr., 1889) complex

I did not think that Evans's treatment of this complex in his recent revision of the *Arhopala* group of genera (*Bull. Brit. Mus.* (*nat. Hist.*) *Entom.* **5** (3) : 85–141) was correct, and tried in vain to make him alter it. At the time there was limited Malayan material available. Since then I have seen more material in the collections of Messrs. Stubbs and Hislop, and caught more myself, and I am convinced that the Indo-Malayan forms dealt with by Evans under *mindanensis* and *pseudomuta* comprise three species.

Evans followed Corbet in adopting as a main key character the presence or absence of a spot at the base of space 10 on UnF. This character is very inconstant, and examples in which the spot is present on one fore wing and not on the other are frequent. It can only be used as a subsidiary character.

In my view the three species are as follows :

(a) *N. ariana* (Evans, 1925) with subspp. *ariana* Tavoy and *arianaga* (Cbt., 1941) Malaya.

(b) *N. elopura* (H. H. Drc., 1894) with subspp. *dama* (Swinh., 1910) Mergui also Kedawi and *elopura* Borneo also Malaya and Sumatra. Examples from Penang are intermediate.

(*c*) *N. pseudomuta* (Stgr., 1889) with subspp. *ariavana* (Cbt., 1941) Langkawi Is., *pseudomuta* (= *rafflesii* (Nic., 1890), *epibata* (Cbt., 1948) SYN. N.) Malaya and *contra* Evans, 1957, Borneo also Sumatra.

N. ariana is the largest species, the F is slightly produced, and in the ♂ of subsp. *arianaga* the black border F is a thread and space 6 on UpH is all blue. On Un the markings are considerably darker than the ground colour, which is faintly suffused with pink. There is never a spot at the base of space 10 on UnF. In Malaya proper it occurs only in the mountains, but in Kedawi it occurs in the plains.

N. elopura has more quadrate wings with the apex F rounded. On UpF the black border is a thread in subsp. *elopura,* and about 1 mm. wide in subsp. *dama.* On UpH space 6 is more than one-half blue in subsp. *elopura.* On the hair-brown Un the markings are barely darker than the ground colour. There is never a spot at the base of space 10 on UnF.

N. pseudomuta has more elongate wings; the black border F is wider than in corresponding *elopura* forms, being 1 mm. in *pseudomuta* and about 1·25 mm. in *ariavana*; space 6 on UpH is more than one-half black; on Un there is occasionally a faint purple glaze in *pseudomuta* and a pronounced glaze in *ariavana.* The spot at the base of space 10 may be present or absent. It is present in the type of *epibata,* absent in the types of *rafflesii* and *ariavana* (though present in an otherwise similar specimen of *ariavana* from Langkawi).

I think *mindanensis* (B. B., 1903) from the Philippines is best regarded as a distinct species, though it may be a subsp. of *pseudomuta.*

I am by no means certain that *pseudomuta* of Staudinger, of which the type, I understand, was lost during the last war, is in fact the same species as that which I call by this name. However it seems best not to alter Evans's use of this name and thereby add to the confusion which already surrounds it (see Evans, 1957, Appx. 5).

23. ***Narathura alaconia media*** Evans, 1957

I have seen a ♀ of this normally tailless species (Langkawi Is., xii.1956–i.1957 (*C. K. Kemp*)), which has a H tail 2·5 mm. long. In all other respects it is indistinguishable from normal *media.* It deserves a name, and I propose *kempi* F. N. after its captor.

It works out as *N. alesia* on Evans's key, but it differs from that species in having the outer edge of the discal spot in space 6 on UnH concave—this spot being convex in *alesia.*

24. ***Panchala elizabethae*** sp. n.

(Pl. 10, fig. 12)

♂ nearest to *P. ariel* Doh., 1891, from which it differs in the following respects: on Up the black border is slightly wider—2 mm. at tornus F expanding to 5 mm. at the apex and nearly 3 mm. on H. The ground colour is bright shining blue, which contrasts strikingly with the non-shining purple of *ariel*. On Un the ground colour has a stronger and more shining purplish glaze, and the markings and tornal metallic scaling on H are arranged as in *ariel*. Genitalia identical with *ariel*, except that the dorsal hooks are slightly longer and thinner.

Holotype ♂ Pahang, Raub, 19.v.1937 (*J. N. Eliot*). Damaged and tails broken off. I have seen another ♂ from Pahang, Chegar Perah, 8.v.1934 (*G. C. Stubbs*), in which the space between the two discal spots in space 7 on UnH is partly filled in with white, resembling *P. ammonides* Doh. in this respect.

25. ***Pratapa sannio ricardi*** subsp. n.

(Pl. 10, fig. 11)

♂ Up ground colour brighter and more silvery blue than subsp. *sannio* H. H. Drc. 1895 from Borneo (known to me only from the ♂ type and original description), with the black border slightly narrower at the tornus F. On Un the white discal band is straighter and twice as wide (about 1·5 mm.) and on H the tornal orange area is more than twice as large, reaching the postdiscal striae in spaces 1b and 2.

♀ on Up the black border is a little wider than in the ♂ and there is a white fleck at end-cell F. Un resembles the ♂.

Holotype ♂ and allotype ♀ Pahang, Gunong Batu Brinchang, 6,600 ft., 5–7.vii.1957 (*J. N. Eliot*). 4 ♂, 5 ♀ paratypes from Fraser's Hill in my coll. Further ♂♂ seen in coll. G. C. Stubbs.

P. sannio has hitherto been known with certainty only from Borneo and Nias, but records of *P. cotys* Hew. from Sumatra probably apply to this species. Cbt. & Pend. (p. 338) evidently regarded *sannio* as a subsp. of the Celebesian *P. anysis* Hew. However the ♂ genitalia differ far too much for conspecificity to be possible. The same applies to *P. cotys* Hew., a further species from India and Burma with subsp. *cremera* (Nic.) from Java.

26. ***Pratapa luculentus taorana*** (Cbt., 1940)

Corbet described *taorana* from a single very battered ♀ and placed it as a subsp. of *P. illurgioides* (Nic., 1890). However it is marked on Un as *P. luculentus* (Leech), not as *P. illurgioides*. A further very fresh ♀ *taorana* from Pahang (Cameron Highlands) in my coll. exactly matches a ♂ *luculentus* from the same locality. *P. illurgioides* should therefore be deleted from the Malayan list.

27. ***Jacoona fabronia lina*** subsp. n.

♂ differs from subsp. *fabronia* (Hew., 1878) from India and Burma in having the UpH all blue to mid-space 5 except for a white marginal line 1 mm. wide in spaces 1a and 1b and just entering 2 (in *fabronia* the tornal white area is wide and diffuse, covering nearly one-quarter of the H). In addition there are no black tornal spots on UpH, such as are prominent in *fabronia*. Un as *fabronia*. F 16 mm.

Holotype ♂ Pahang, Gunong Batu Brinchang, 6,600 ft., 7.vii.1957 (*J. N. Eliot*). There is a similar ♂ in coll. Hislop (Pahang, Fraser's Hill, 24.vi.1953).

I have also seen 2 ♀ from Fraser's Hill in coll. Stubbs which differ from *fabronia* ♀ in possessing a narrow straight white discal band on UpH running from the costa to the tornal white area at V 4. Occasionally Burmese ♀♀ have this band faintly indicated.

28. *Ticherra acte liviana* Fruh., 1912

Occurs quite commonly on either side of the Ginting Sempak pass between Selangor and Pahang from about 800 ft. to 2,000 ft. Hitherto only the nominotypical subsp. has been recorded in Malaya from Perlis, but in fact Perlis examples are intermediate between *acte* and *liviana*.

29. *Marmessus scudderii perlisa* Riley, 1942

♂ Selangor, Pahang Road 16 M.S., 13.iv.1956 (*J. A. Hislop*). Hitherto only known from Perlis.

30. *Marmessus rufotaenia rufotaenia* Fruh., 1912

♂ ♀ Langkawi Is. (*G. C. Stubbs*) and ♀ Perlis (*J. N. Eliot*) have a small orange patch on UpF, thus showing an approach to the Burmese subsp. *archbaldi* Evans. Hitherto the species has not been known to occur in Malaya outside Singapore Is.

31. *Artipe eryx excellens* subsp. n.

♂ larger than nominotypical *eryx* (L., 1771) from China (F 21–23·5 mm. as against 15–20 mm.). Up blue ground colour brighter and more extensive, reaching 2–3 mm. beyond cell on F and filling at least half space 6 on H. Black border F narrower, inwardly straight, 1·5 mm. wide at tornus increasing to about 7 mm. at costa. Un deeper, more emerald green.

Holotype ♂ Pahang, Fraser's Hill, 4,000 ft., 19.iv.1957 (*J. N. Eliot*). Nine ♂ paratypes in my coll.

A. eryx has an undeserved reputation for extreme rarity in Malaya. Males occur fairly frequently on exposed hill tops, but are apt to be overlooked as they only appear during the last two hours of daylight. They probably also fly for a short time soon after dawn, like some *Rapala* spp. Indian and Burmese examples of *eryx* are intermediate between subspp. *eryx* and *excellens*.

32. *Rapala rhodopis* Nic., 1896

Three ♂, 6 ♀ Pahang, Gunong Batu Brinchang, 6,600 ft., vii.1957, and Fraser's Hill, 4,000 ft., viii–ix.1957 (*J. N. Eliot*). Further ♂♂ seen in coll. Stubbs from Fraser's Hill and Kuala Lipis. New to Malaya.

33. *Bindahara phocides phocides* (F., 1793)

Occasionally Malayan ♂♂ have a bright blue marginal streak in spaces 2 to 4 on UpH, rather as in subsp. *moorei* Fruh. from Ceylon and S. India.

HESPERIIDAE

34. *Choaspes benjaminii formosana* Fruh., 1911

♂ Upper Perak, Telemong, 12.viii.1949 (*J. A. Hislop*), 2 ♂ Pahang, Cameron Highlands, 7.viii.1955 and Fraser's Hill, 16.viii.1951 (*G. C. Stubbs*). New to Malaya.

35. *Celaenorrhinus putra sanda* Evans, 1941

♂ Upper Perak, ix.1949 (*J. A. Hislop*). Hitherto known in Malaya with certainty only from the Langkawi Is.

36. *Celaenorrhinus pyrrha* Nic., 1889

♀ Pahang, Fraser's Hill, 8.vii.1949 (*G. C. Stubbs*). New to Malaya.

37. *Celaenorrhinus nigricans* Nic., 1885

♂ Pahang, Kuala Terla, 4,000 ft., 17.ix.1957 (*J. N. Eliot*). New to Malaya.

38. *Coladenia agnioides* Elw. & Edw., 1897

Two ♂ Pahang, Fraser's Hill, 4,000 ft., 24.iii.1957 (*J. N. Eliot*) and 16.vi.1957 (*G. C. Stubbs*). New to Malaya.

39. *Pintara pinwilli pinwilli* (Btlr., 1877)

♂, ♀ Malacca, Jasin, 26.v.1955 (*G. C. Stubbs*), ♂ Pahang, Ginting Sempak, 1,500 ft., 7.viii.1957 (*J. N. Eliot*). These appear to be the first records of this rare species in Malaya since the type was taken more than 80 years ago.

40. *Daimio phisara* Mre., 1884

♂ Perlis, Kaki Bukit, 21.ix.1957 (*J. N. Eliot*), with a comparatively broad, clear white discal band on UpH, resembles Burmese examples of the wet season fairly closely and is referable to subsp. *phisara*. New to Malaya.

The form occurring in Malaya proper represents a new subsp.:

D. phisara tristis subsp. n.

(Pl. 10, fig. 13)

♂ on UpF the white spots in spaces 2 and 3 and at end-cell are smaller than in other subspp., that in space 2 being crescentic. On UpH the white band is narrow, sullied, intermediate in appearance between subspp. *phisara* (wet season form) and *tenebrosa* J. & T. The spot end-cell on H is fainter than usual on Up and absent on Un. On UnH the white band is unsullied and 3·5–4·0 mm. wide, as in subsp. *phisara*. F 17·5 mm.

Holotype ♂ Pahang, Ginting Sempak, 1,750 ft., 14.iv.1957 (*J. N. Eliot*). Paratype ♂ Singapore, 3.ix.1936 (*J. N. Eliot*) in my coll. A ♂ in B.M. from Sumatra, Siboga, ii.1903 (ex *Oberthur* coll.) is almost identical with the Singapore ♂.

41. ***Halpe zema*** (Hew., 1877) complex

(Pl. 10, figs. 14–16)

The forms dealt with by Evans, 1949 (*A catalogue of the Hesperiidae from Europe, Asia and Australia in the British Museum* (*Nat. Hist.*)) under *H. zema* and *H. zola zamba* Cbt. comprise 3 closely-allied but apparently distinct species, all of which occur in Malaya without any evidence of interbreeding. I have taken all 3 at the same time and place feeding on the mauve flowers of the Siam Weed (*Eupatorium* sp.).

The 3 species are :

(a) *H. zema* (Hew., 1877) with subspp. *zema* (Sikkim to N. Burma and Indo-China) and *zamba* Cbt., 1940 (Malaya also Borneo).

(*b*) *H. ormenes* (Pl., 1886) with subspp. *vilasina* Fruh., 1911 (Sumatra also Malaya), *vistula* Evans, 1937 (Borneo), *vistara* Fruh., 1911 (Java), *ormenes* (Nias) and probably *mahapara* Fruh., 1911 (Palawan).

(c) *H. elana* sp. n. infra (Malaya also S. Burma).

Though fresh examples can normally be determined by superficial characters, examination of the genitalia is a safer guide. In the ♂ genitalia the distal half of the clasp gives specific characters (see Text-fig. 5). In *zema* it is fully spined only along its outer, dorsal edge ; the tip of the clasp is dorsally expanded, and then bent inwards at right angles. In *ormenes* and *elana* it is spined on both sides and the tip is spathulate. In *elana* the spoon is straight and flattened, in *ormenes* slightly curved inwards and trough-like. In Cbt. & Pend. genitalia fig. 282 represents *elana*, but is a little distorted, probably through mounting on a flat slide,

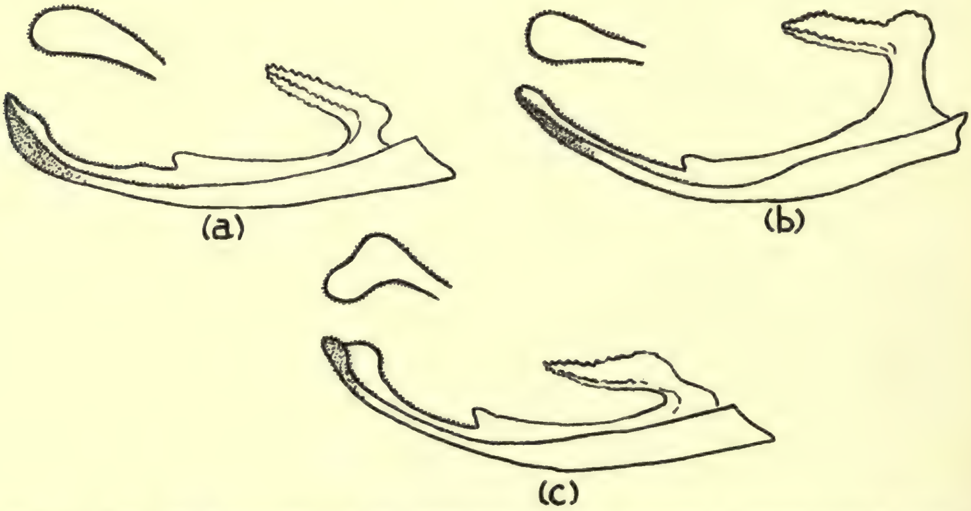

FIG. 5. Left clasp and (above) distal extremity of clasp showing optimum view of the " spoon " of : (a) *Halpe ormenes vilasina* Fruh. (Malaya), (b) *H. elana* sp. n. (Malaya), (c) *H. zema zamba* Cbt. (Malaya).

In the ♀ genitalia the ostium bursae is flanked by two antler-like processes (see Text-fig. 6). In *zema* the " antlers " are very broad, rather short and carry numerous points ; in *ormenes* they are longer, narrower and carry fewer points ; in *elana* they are still narrower and may comprise a single point.

Judged by the genitalia *H. ormenes* and *H. elana* are more nearly related to each other than to *H. zema*, and probably developed from a common ancestor in Malaysia and S. Burma respectively. *H. elana* must have extended its range into Malaya in very recent times—since the final separation of Sumatra and Borneo from Malaya —since it has not reached the islands. *H. zema* is a common species in Sikkim and Assam, and it probably developed from the same common ancestor in this area. However, it must have begun to spread southwards before *elana* as, despite its more northerly origin, it has reached Borneo.

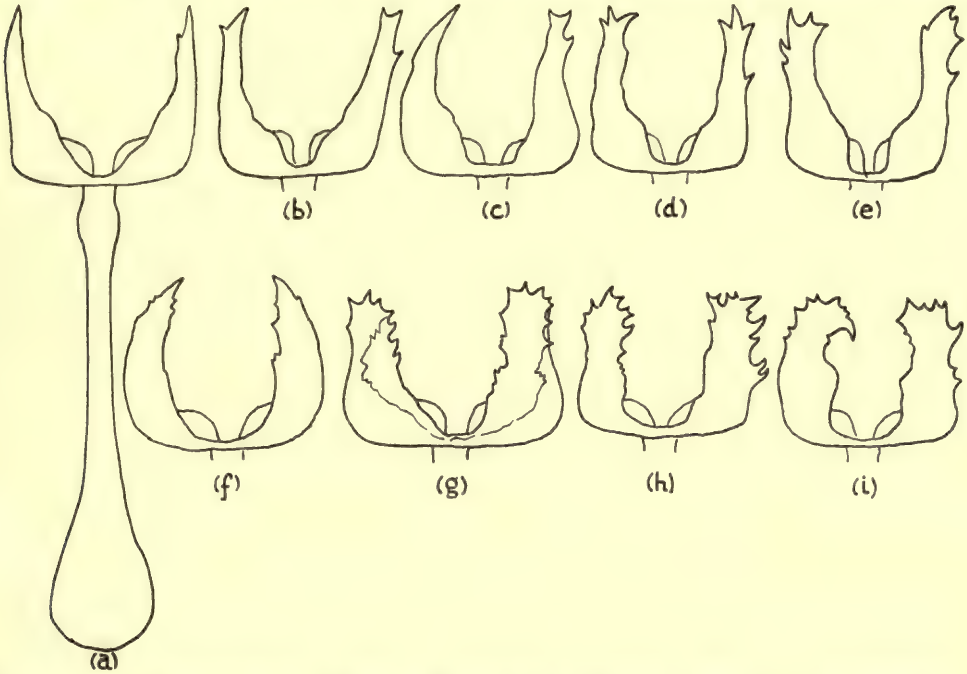

FIG. 6. Genital plate with " antlers " and bursa ((a) only) of : (a), (b), (c) *Halpe elana* sp. n. (Malaya), (d), (e) *H. ormenes vilasina* Fruh. (Malaya), (f) *H. ormenes vistula* Evans (Borneo), (g) *H. zema zema* (Hew.) (Sikkim), (h), (i) *H. zema zamba* Cbt. (Malaya).

42. *H. elana* sp. n.

(Pl. 10, fig. 14)

♂ Up similar to *H. ormenes vilasina* Fruh., and differing from *H. zema zamba* Cbt. in that the spots in spaces 2 and 3 on UpF do not overlap so much. On UnH the whitish band is narrow (about 1·0–1·5 mm. wide), yellowish, inwardly straight, outwardly irregular, with the veins dark-dusted across it (in *ormenes* and *zema* the band is wider—almost clear white and straight-edged in *ormenes*, rather yellowish and irregular in *zema*). Genitalia as described above. F 17·5 mm.

♀ differs from *ormenes* and *zema* ♀♀ in the narrower band on UnH, which generally resembles that of the ♂, though it may be slightly wider (up to 2·0 mm.). F 19·5 mm.

Holotype ♂ Pahang, Ginting Sempak, 1,000 ft., 6.i.1957 (*J. N. Eliot*). Allotype ♀ Pahang, Ginting Sempak, 1,000 ft., 20.i.1957 (*J. N. Eliot*). A series from Ginting Sempak and Fraser's Hill in my coll., and a series in B.M. from S. Burma. The latter were placed under *ormenes* by Evans (op. cit.), presumably because the nominotypical subsp. from Nias has a rather similar narrow white band on UnH.

43. ***Halpe zola zola*** Evans, 1937

♂ Perlis, Kaki Bukit ridge, 1,500 ft., 7.i.1939 (*C. F. Cowan*). New to Malaya. As shown above, the record of *zola* in Cbt. & Pend. is erroneous. Though superficially very similar to the species of the *H. zema* complex, the genitalia of *H. zola* show it to be fairly widely separated from them. The ♀ genitalia, in particular, are quite different and lack the " antlers ".

44. ***Halpe porus*** (Mab., 1876)

♀ Perak, Taiping Club, 10.xi.1953 (*C. F. Cowan*). Doubtfully recorded by Cbt. & Pend.

45. ***Halpe hauxwelli*** Evans, 1937

♂ Pahang, Fraser's Hill, 4,000 ft., 19.iv.1957 (*J. N. Eliot*). New to Malaya.

46. ***Scobura woolletti woolletti*** Riley, 1923

♂, 2 ♀ Pahang, Ginting Sempak, 1,000 ft., xii.1956–i.1957 (*J. N. Eliot*). New to Malaya.

47. ***Suastus minuta*** (Mre., 1877)

Hitherto the only Malayan record of *S. minuta* has been of subsp. *aditia* Evans, 1943, from the Langkawi Is. A female from Perak, Grik District, Bersia, 15.viii.1949 (*J. A. Hislop*) constitutes the first record of this subsp. from Malaya proper. I have also seen from Malaya one example of the superficially very different subsp. *scopas* (Stgr., 1889) (♀ Pahang, Ginting Sempak, 29.xii.1940 (*G. C. Stubbs*).) This suggests that *scopas* may have achieved specific status.

48. ***Zographetus ogygia*** (Hew., 1866) complex

Evans (1949, op. cit., p. 300), whilst commenting on " the bewildering variation in the ♂ genitalia, the presence or absence of the ♂ brand and the appearance of the UnH " considered that there was only one real species in the complex. He grouped all the described forms into four subspp.: *ogygia* (with *flavipennis* (Nic., 1885) and *flavalum* (Nic., 1887) listed as syns.), *andamana* Evans, 1926, *durga* (Pl., 1884) and *ogygioides* Elw. & Edw., 1897.

I have re-examined the genitalia of all the examples in B.M. dissected by Evans and also some further Malayan examples in my own collection, and my conclusions differ from those of Evans in some respects.

The ♂ genitalia (see Text-fig. 7) of nominotypical *ogygia* (= *flavipennis* (Nic.)) show considerable individual variation, especially in the outline of the clasp and in the paired sub-uncal processes, which comprise a narrow outer arm united to an inner spined or dentate lamina. Although no two specimens are exactly alike, I have nevertheless been struck how all the specimens I have examined break down into two forms. Form *a*, to which belong the types of *ogygia* and *andamana* Evans, has the outer arm always short, the inner lamina small and carrying comparatively few large spines, usually roughly arranged in two rows round the periphery. Form *b*, which is rarer, has the outer arm of variable length, though usually longer than form *a*, whilst the inner lamina is larger and covered almost all over with numerous small teeth. Sometimes form *a* has a few minute teeth on the inner lamina in addition to the peripheral spines (as in Text-fig. 7(*a*)), thus showing an approach to form *b*. However I have seen no convincing evidence of one form grading gradually into the other, and I think it is probable that two species are involved. But in view of the pronounced tendency to individual variation and the impossibility of distinguishing the two forms with certainty on superficial characters (though in Malaysia form *a* has at most a faint apical purple wash on UpF, whilst form *b* has a strong wash),

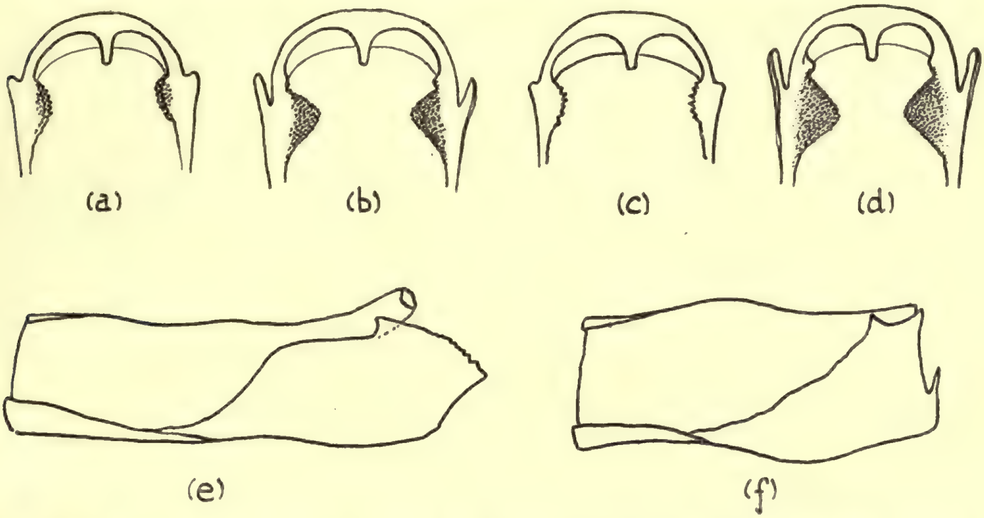

FIG. 7. End-on view of uncus, to show sub-uncal processses, of: (a) *Zographetus ogygia ogygia* (Hew.) form *a* (Malaya, (b) *Z. ogygia ogygia* (Hew.) form *b* (f. *doxus* f. n.) (Malaya), (c) *Z. ogygioides* Elw. & Edw. (Malaya), (d) *Z. kutu* sp. n. (Malaya). Right clasp of: (e) *Z. kutu* sp. n. (Malaya), (f) *Z. ogygia sanga* subsp. n. (Sumbawa).

I think it is best to leave them both lumped under *ogygia*. Form *b*, however, deserves a name and I propose *doxus* F.N. (holotype ♂ S. Burma, Victoria Point, iii.1919 (ex *W. H. Evans* coll.)).

Z. flavalum (Nic.), which Evans placed as a syn. of *ogygia*, is represented in the B.M. only by the ♂ type from Sikkim. Superficially it is very different on UnH and the genitalia are markedly different, lacking the sub-uncal processes. I consider it to be a good species, which does not belong to the *ogygia* complex at all.

Z. durga (Pl.) from the Philippines has the inner lamina somewhat resembling that organ in *Z. satwa* (Nic., 1883), which it also resembles on Un. In all other respects it is closer to *ogygia*, and is best left as a subsp. of that sp.

Specimens from the Lesser Sunda Is., which Evans placed under *durga*, have a highly aberrant clasp, and must therefore be regarded as constituting a good subsp. :

Z. ogygia sanga (Evans MS.) subsp. n.

Superficially indistinguishable from *durga* (Pl.). The ♂ genitalia have the clasps ending in a sharp upturned spine (see Text-fig. 7(*f*)), a feature which is unique in the genus, but otherwise do not much differ from those of *durga*, though the outer arm of the sub-uncal process is longer and broader.

Holotype ♂ Sumbawa, ix.1891 (ex *W. H. Evans* coll.). B.M. has also ♂ Lombok, ♂ S. Flores, ♀ Alor.

Z. ogygioides Elw. & Edw. flies with *ogygia* in Malaya, Sumatra and Borneo. It shows much less individual variation in the ♂ genitalia than *ogygia*. The outer arm is always vestigial and the inner lamina small, carrying about 6–8 large spines in a single row round the periphery. Superficially it differs from *ogygia* in lacking brands on UpF, whilst on UnH it has a more unicolorous reddish-brown ground colour, on which the discal spots are clearly marked. As there is no evidence of any grading into *ogygia*, and as the geographical overlap is so large, I consider that it is a good sp.

In Malaya there occurs yet another brandless sp., which is more easily recognizable than *ogygioides* :

49. ***Z. kutu*** sp. n.

Larger than *ogygioides* (F 16 mm. as against 14–15 mm.). ♂ UpF with spots arranged as in *ogygia* and *ogygioides*, but differing from both in having the whole wing washed with dull non-shining purple (the purple wash, when present, is more apical and shining in the other two spp.). There are no brands on UpF. UnH uniform reddish-brown, usually with a purple flush, the discal spots vestigial or absent. ♂ genitalia with the sub-uncal processes carrying a long outer arm and large inner lamina covered all over with numerous minute teeth, resembling *ogygia* form *b*, though both outer arm and inner lamina are a little larger (see Text-fig. 7(*d*)).

Holotype ♂ Selangor, Bukit Kutu, 3,300–3,500 ft., 23.ix.1932 (*H. M. Pendlebury*). Four ♂ paratypes from Pahang, Fraser's Hill, iv–ix.1957 in my coll. Other ♂♂ seen in coll. Stubbs.

50. *Hyarotis stubbsi* sp. n.

(Pl. 10, fig. 17)

♀ nearest to *H. adrastus* (Stoll). Up blackish brown. F with large, quadrate, contiguous, hyaline spots in space 2 and the outer part of the cell, a minute hyaline spot at the base of space 3, and minute apical spots in spaces 6–8, only that in 6 being hyaline. On UnF the spots in 3 and 6–8 are slightly enlarged, and there are large, diffuse, tornal white spots in spaces 1a and 1b and a diffuse white costal spot above, and rather wider than, the cell spot. There is also a sub-marginal series of obscure dark spots running from V 2 to the costa. On UnH the basal area from mid-costa to the cubitus, including the whole of the cell, is darkened, and there is an obscure post-discal series of contiguous dark spots from V 1b to V 7 arranged in an even curve. Cilia F and H uniform dark brown, not chequered pale and dark brown as in *adrastus*. Palpi grizzled as in *adrastus*. Antennae not completely white-ringed below the apiculus, as in *adrastus*, but with a white patch on the Un of the club. F 18 mm.

Differs additionally from *adrastus* in the following respects : absence of a white spot in space 1 on UpF ; much larger spots in spaces 2 and cell with their inner edges in line ; much larger white costal and tornal spots on UnF ; complete absence of the white band always present onUnH, at least vestigially, in *adrastus*.

Holotype ♀ Pahang, Fraser's Hill, 25.ix.1949 (*G. C. Stubbs*). Unique.

51. *Plastingia tavoyana* Evans, 1926

♀ Pahang, Kuala Lipis, 3.ix.1934 (*G. C. Stubbs*). Hitherto recorded in Malaya only from Langkawi Is.

52. *Potanthus pamela* Evans, 1934

♂ Pahang, Fraser's Hill, 4,000 ft., 26.vi.1953 (*J. A. Hislop*). New to Malaya. Superficially very similar to the much commoner *P. rectifasciata* (Elw. & Edw.), which occurs in the same locality, but easily recognized by the broad V-shaped uncus.

53. *Potanthus pava pava* (Fruh., 1911)

♂ Perak, Grik, 10.vi.1956 (*J. A. Hislop*). Hitherto recorded in Malaya only from the Langkawi Is.

54. *Telicota ancilla bambusae* (Mre., 1878)

The occurrence of this butterfly in Malaya seems hitherto to have been based on a single ♂ in B.M. labelled " Singapore, J. J. Walker ". This example is much closer to the Ceylon form of *ancilla* than to the forms occurring in S. Burma or Borneo. The late Cdr. Walker collected widely in the East, and the example is, I believe, wrongly labelled. However *T. ancilla* does, I think, occur in Malaya in a form superficially rather similar to the Bornean subsp. *santa* Evans, though smaller and with narrower orange markings. It differs from *santa* and the Indo-Burmese subsp. *bambusae* in the ♂ genitalia, which resemble those of *T. linna* Evans, 1937, in having a long curved valva and prominently protruding cuiller. Indeed, if judged by ♂ genitalia alone, it would be best placed as a *linna* form. It is, however, quite distinct from *T. linna bina* Evans, differing in the following respects : the lower surface of the antennal club is ringed with black, this being plain yellow in *bina* ; the base of space 3 on UpF is nearly always black, this being orange in *bina* ; the black discal fascia, on which the ♂ stigma is placed, is not bowed outwards as in *bina* ; on UpH the orange discal band very seldom extends into space 6, as it always does in *bina* ; on UnH the veins are not dark-dusted across the orange discal band.

The ♂ genitalia of undoubted specimens of *T. ancilla bambusae* show some individual variation, and this Malayan form is, I think, best left provisionally as *bambusae.* I have taken 10 ♂, 1 ♀ in the central range between 1,000 ft. and 4,000 ft.

55. ***Telicota hilda*** sp. n.

(Pl. 10, fig. 18)

All the forms from Malaya to the Philippines and Australia placed by Evans under *T. augias* (L.) have the orange discal band on UpH extending above V 6. In the mountains of Malaya there occurs a form with similar ♂ genitalia in which the band never extends above V 6 and which differs in a number of other respects. Though possibly a montane form of *augias,* I think it is more correctly regarded as a good species.

♂ nearest to *T. augias augias* (L.), judged by the ♂ genitalia, but the valva is a little longer and is more heavily studded with larger spines. On Up the orange markings are narrower than in any *augias* subsp.; on F the base of space 3 is black ; on H the discal orange band never extends above V 6. On UpF the portion of the discal stigma lying in space 1 is usually markedly concave outwardly. On UnH the ground colour is dusky ochreous, against which the discal orange band contrasts conspicuously. The Vs crossing this band are dark-dusted, as in the Philippine *T. augias pythias* (Mab.). The antennal club is strongly black-striped below. F 17 mm.

Holotype ♂ Pahang, Fraser's Hill 4,000 ft., 10.ix.1957 (*J. N. Eliot*). Five ♂ paratypes from Fraser's Hill at elevations of 2,000–4,000 ft. in my coll. Further ♂♂ seen in coll. J. A. Hislop. B.M. has 1 ♂ from Victoria Point, S. Burma.

56. ***Caltoris bromus bromus*** (Leech, 1894)

Two ♂ Pahang, Ginting Sempak, 1,000 ft., xii.1956–i.1957, ♂ Selangor, Templer Park, 4.v.1957 (all *J. N. Eliot*), ♀ Perak, Grik, 31.vii.1957 (*J. A. Hislop*). Recorded doubtfully from Malaya by Cbt. & Pend.

57. ***Caltoris tulsi tulsi*** (Nic., 1884)

♂ Selangor, Ginting Sempak, 1,500 ft., 14.vii.1957 (*J. N. Eliot*) has no pale fascia on UnF or UnH, the dark brown ground colour being uniformly washed with purple. There is a similar ♂ in B.M. from Sumatra and another from Borneo, all of which have normal ♂ genitalia.

SUMMARY

Seven new species of butterflies from Malaya and Burma, 8 new subspecies and 2 new forms are described. A number of butterflies are recorded from Malaya for the first time, and the known geographical range of others has been extended. In addition an attempt has been made to sort out into their constituent species several complexes of hitherto uncertain status.

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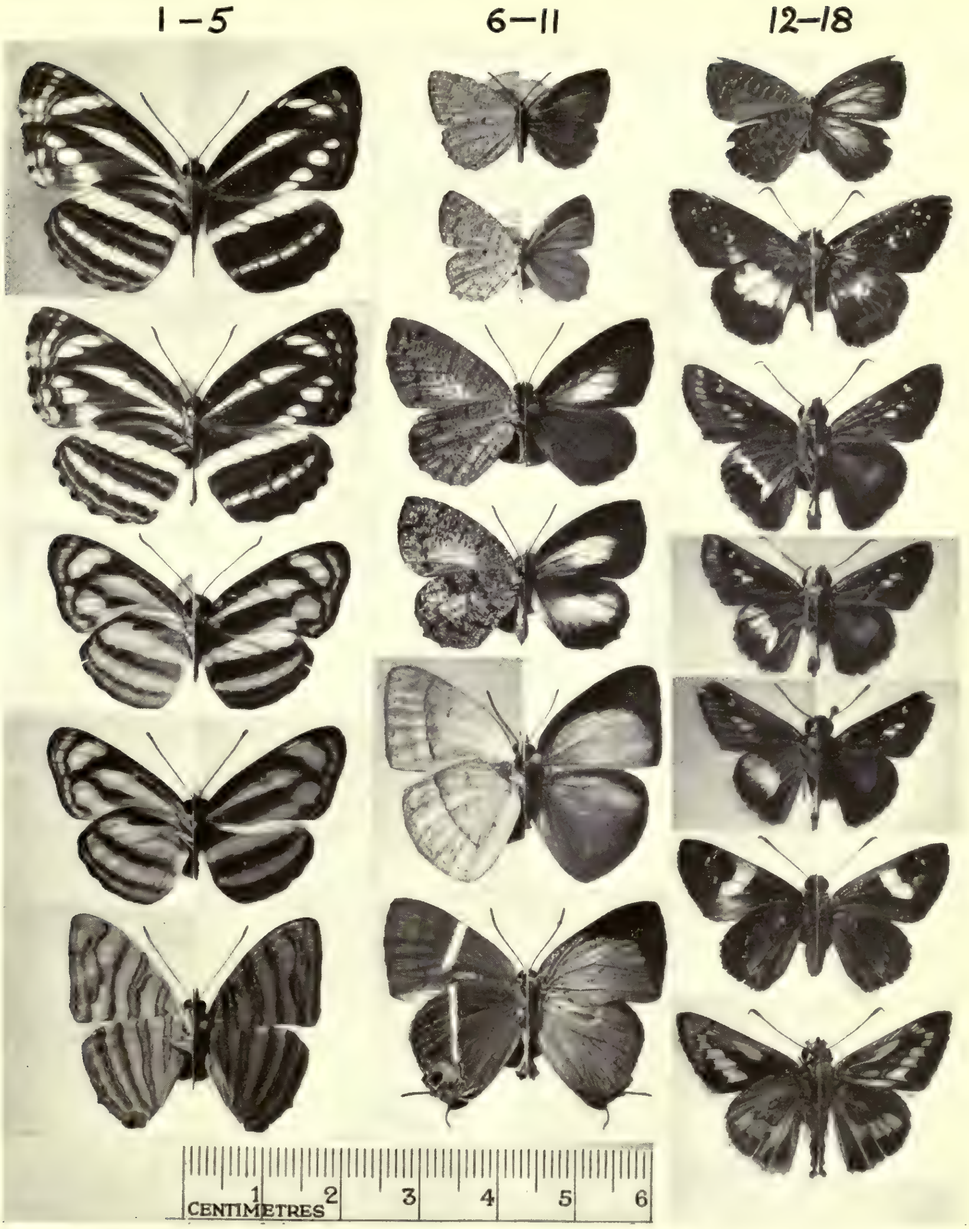
PLATE 10

(Figures are numbered vertically by columns from left to right.)

Fig. 1. *Neptis clinioides* Nic. ♂ (Malaya).
Fig. 2. *Neptis clinia leuconata* Btlr. ♂ (Malaya).
Fig. 3. *Neptis heliodore dorelia* Btlr. ♂ (Malaya).
Fig. 4. *Neptis roepkei ioannis* subsp. n. ♂ (Malaya).
Fig. 5. *Chersonesia intermedia intermedia* Mart. ♂ (Malaya).
Fig. 6. *Allotinus davidis* sp. n. Holotype ♂ (Singapore).
Fig. 7. *Allotinus davidis* sp. n. Paratype ♀ (S. Johore).
Fig. 8. *Allotinus fallax michaelis* subsp. n. Holotype ♂ (Malaya).
Fig. 9. *Allotinus fallax michaelis* subsp. n. Allotype ♀ (Malaya).
Fig. 10. *Curetis freda* sp. n. Paratype ♂ (Malaya).
Fig. 11. *Pratapa sannio ricardi* subsp. n. Holotype ♂ (Malaya).
Fig. 12. *Panchala elizabethae* sp. n. Holotype ♂ (Malaya).
Fig. 13. *Daimio phisara tristis* subsp. n. Holotype ♂ (Malaya).
Fig. 14. *Halpe elana* sp. n. Holotype ♂ (Malaya).
Fig. 15. *Halpe zema zamba* Cbt. ♂ (Malaya).
Fig. 16. *Halpe ormenes vilasina* Fruh. ♂ (Singapore).
Fig. 17. *Hyarotis stubbsi* sp. n. Holotype ♀ (Malaya).
Fig. 18. *Telicota hilda* sp. n. Paratype ♂ (Malaya).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CENTIMETRES

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NATURAL HISTORY

A STUDY OF THE NEW ZEALAND CHIRONOMIDAE (DIPTERA, NEMATOCERA)

PAUL FREEMAN

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Pp. 393–437 ; *Plate* 11 ; 6 *Text-figures*

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A STUDY OF THE NEW ZEALAND CHIRONOMIDAE (DIPTERA, NEMATOCERA)

By PAUL FREEMAN

THE first two species of New Zealand Chironomidae were described by Hudson in *An Elementary Manual of New Zealand Entomology* (1892), one species being placed in *Chironomus* and the other in *Corethra*. Hutton added another eleven in 1902 and since then Kieffer (1922), Tonnoir (1923) and Pagast (1947) have further increased the total to 19. No attempt has been made to give keys and descriptions for all the known species since Hutton's paper in 1902 (*Trans. New Zealand Inst.* **34** : 180–187).

The basis for the present Study is the collection of almost 700 specimens in the British Museum supplemented by nearly 200 borrowed from the Canterbury Museum, Christchurch. These collections contain about 50 species, but I have actually only described or redescribed 41 species because about eight species of Orthocladiinae and one species of Corynoneurinae are represented either by females or by damaged specimens ; this compares favourably with Tonnoir's estimate of 55 species (1923, *Bull. Soc. ent. Belge* **5** : 93). More than one-third of the specimens available to me were collected at Ohakune in the Provincial District of Wellington and the other two-thirds mostly in the Districts of Auckland and Canterbury. Although species of Chironomidae tend to be widely distributed, it is probable that the number of known species could be increased if larger collections were made in other Districts. I am making no pretence that this is in any way a full revision, but it is hoped that it at least includes most of the commoner species and that it may act as an incentive to further collecting and study so that the family may become more fully known.

Of the 19 species that have been described by previous authors, I have examined type material of 13 and have been able to recognize all except two of the remainder. These two are *Chironomus lentus* Hutton and *Dactylocladius commensalis* Tonnoir. The table shows the actual or probable position of all 19 in a more modern classification, which is that used in my "Study of the Chironomidae of Africa South of the Sahara" (see *Bull. Brit. Mus.* (*nat. Hist.*) *Entom.* vols. 4–6, 1955–58).

I am indebted to Mr. E. G. Turbott of the Canterbury Museum for lending me type material of Hutton's species and un-named material and to Dr. R. Pilgrim of Canterbury University College for giving me great help with comparisons with Hutton's specimens. I wish also to express my thanks to Dr. W. Hennig of Deutsches Entomologisches Institut for lending me the types of species described by Kieffer and to both Dr. R. G. Ordish and Dr. Dell of the Dominion Museum, Wellington for comparing specimens with the type of *Corethra antarctica* Hudson.

A detailed account of the structures of taxonomic importance is given in Part I of my Study of African Chironomidae referred to above but for convenience I am giving the following notes.

Antennal ratio given as A.R., is the ratio of the greatly elongated last or last two (Tanypodinae) segments of the flagellum to the short basal ones taken together.

The leg ratio, referred to as L.R., is the ratio of the anterior basitarsus to the tibia. The tarsal beard is the row of long hairs seen along part of the anterior tarsus of the males of some species.

The thoracic markings follow a definite pattern throughout the family with the areas of muscle insertion darker than other parts of the cuticle. The most obvious darker areas are the so-called "mesonotal stripes" consisting of a short central (sometimes divided centrally) band in the front half of the mesonotum and two lateral ones in the posterior half.

The wing venation employed uses Tillyard's modification, whereby Cu_1 of earlier authors is regarded as M_{3+4}. The cross-vein m-cu of authors then becomes the true base of this vein and the cubital fork a compound fork which I call the posterior fork. Cu_2 of authors is now Cu_1.

TABLE.—*Previously Known New Zealand Species of Chironomidae*

Author and Reference	Original name	Actual or probable position
Hudson, 1892, *Manual of New Zealand Entomology*	*Tanypus antarctica*	*Anatopynia antarctica.*
	Chironomus zealandicus	*Chironomus zealandicus.*
Hutton, 1902, *Trans. New Zealand Inst.* **34** : 180–187	*Chironomus lentus*	? *Polypedilum.*
	C. opimus	*Polypedilum opimus.*
	C. pavidus	*P. pavidus.*
	C. ignavus	*Polypedilum.*
	Orthocladius publicus	*Orthocladius*
	O. cingulatus	*Cricotopus cingulatus.*
	Camptocladius vernus	*Smittia vernus.*
	Tanytarsus vespertinus	*Tanytarsus vespertinus.*
	Tanypus languidus	*Anatopynia languidus.*
	T. debilis	*A. debilis.*
	T. malus	*Pentaneura* (*Ablabesmyia*) *malus.*
Kieffer, 1922, *Ann. Soc. Linn. Lyon.* **68** : 145–148	*Chironomus novae-zelandiae*	*Chironomus zealandicus.*
	Macropelopia hudsoni	*Anatopynia antarctica.*
	M. novae-zelandiae	*A. debilis.*
Tonnoir, 1923, *Ann. Biol. Lacust.* **11** : 284	*Dactylocladius commensalis*	*Orthocladius.*
Pagast, 1947, *Arch Hydrobiol.* **41** : 446–448	*Lobodiamesa campbelli*	*Lobodiamesa campbelli.*
	Maoridiamesa harrisi	*Maoridiamesa harrisi.*

AFFINIITES OF THE NEW ZEALAND CHIRONOMIDAE

Although the present paper cannot be considered in any way a complete revision of the New Zealand species, there are representatives of more than 20 genera and thus some idea can be obtained of the affinities of the Chironomid fauna as a whole.

At the subfamily level, the Clunioninae are quite unrepresented but examples may well be found later ; there is a single specimen, too damaged for description, belonging to the Corynoneurinae, genus *Corynoneura*, in the material at my disposal. All the other subfamilies are present, there being 12 species of Tanypodinae, one of Podonominae, two of Diamesinae, about 17 of Orthocladiinae (only nine described), and 17 of Chironominae. This is a very similar distribution of species for each subfamily to that for the British fauna, differing mainly, apart from the absence of the Clunioninae, in the higher number of species of Tanypodinae in proportion to the species of Orthocladiinae and Chironominae.

The genera *Lobodiamesa*, *Maoridiamesa*, *Ophryophorus* and *Paucispinigera* are peculiar to New Zealand and representatives are not known from any other part of the world. It will be interesting to see whether any of them are eventually found in Patagonia. The new genus *Harrisius* is represented in the British Museum by a second, as yet undescribed, species from New Guinea. The Patagonian genus *Rhinocladius* Edwards has no New Zealand species known to me.

The single species of *Riethia* shows a great similarity in general and hypopygial structure to a species from Patagonia and South Chile placed by Edwards in *Pseudochironomus*. As explained below, I have transferred them both to *Riethia*, a genus including Australian species. *Diplocladius lacuniferus* shows considerable resemblance to Patagonian species (placed by Edwards in the genus *Stictocladius*), but *D. pictus* equally shows affinities with Palaearctic and possibly African species. These are the only outstanding examples that I have been able to find in the Chironomidae of close similarity between the New Zealand and southern South American faunas, as they are known at present, although there is resemblance shown by a species of *Anatopynia* (see below).

All the other species belong to well-known genera with world-wide distribution, many including abundant species in other Regions. These genera are *Pentaneura*, *Anatopynia*, *Podonomus*, *Metriocnemus*, *Cricotopus*, *Trichocladius*, *Chaetocladius*, *Orthocladius*, *Smittia*, *Chironomus*, *Polypedilum* and *Tanytarsus*. An interesting feature, probably associated with the isolated position of New Zealand is the paucity of species, but further collecting is certain to increase the length of the list considerably.

Of these genera, the only ones with more than four species are *Anatopynia* (ten species) and *Polypedilum* (seven species). *Anatopynia*, although of world-wide distribution is a genus that seems to be especially associated with the cooler water found in the more temperate latitudes and in mountainous areas. There are similarly about ten species known from Patagonia and South Chile, one of which, *A. apicina* Edwards, is extremely similar to the New Zealand species *A. apicinella* sp. n. Apart from this one species, the remainder seem to resemble the Palaearctic species as much as they resemble those from Patagonia. The resemblance is heightened by the presence of two species of Edwards' Group C (see below), a group previously known only from the Holarctic Region and absent from Patagonia. The species of *Polypedilum* are fairly heterogeneous. Whilst some, such as *P. pavidus* are quite typical of the genus, *P. opimus* although certainly belonging to *Polypedilum* has a somewhat unusual wing venation and trichiation. *Polypedilum* is probably more typical of the warmer latitudes; only two species were found by Edwards in southern South America and they show no particular resemblance to the New Zealand species. One New Zealand species, *P. longicrus*, is of interest because it has previously been recorded only from Africa south of the Sahara and may possibly have been introduced to New Zealand.

Of the remaining species, some (e.g. *Podonomus ohakunensis*, *Metriocnemus lobifer* and *Cricotopus zealandicus*) are most closely allied to Palaearctic species, whilst *Trichocladius pluriserialis* is closest to an African species. *Orthocladius pictipennis* is unusual in possessing patterned wings but does not seem to be at all closely allied to any of the Patagonian Orthocladiinae similarly adorned.

In conclusion it may be said that the Chironomid fauna of New Zealand, as known at present, includes scattered species mostly from the larger genera of the family; there are also four genera known only from New Zealand. The genera present and the number of species from each subfamily agree with the normal fauna of a temperate region. The relationships of the species are varied, probably the greater number of species show similarities to Palaearctic species, but *Anatopynia apicinella*, *Diplocladius lacuniferus* and *Riethia zeylandica* show distinct Patagonian affinities. None of the peculiar New Zealand genera has yet been found in Patagonia, nor has the Patagonian genus *Rhinocladius* been found to occur in New Zealand.

KEY TO SUBFAMILIES OF CHIRONOMIDAE

1. True base of M_{3+4} present (m-cu of authors) 2
   Base of M_{3+4} absent 4
2. Postnotum lacking median furrow; R_{2+3} completely absent, although radial veins well separated . . . . Podonominae
   This furrow and R_{2+3} present, or else radial veins very close 3
3. R_{2+3} forked (in some small species of *Pentaneura* it may be crowded out, but then wings very hairy) . . . . Tanypodinae
   R_{2+3} simple and distinct, wings usually bare . . . . . . Diamesinae
4. Ratio of anterior basitarsus to tibia ("leg ratio" or "L.R.") less than 1; anterior tibia with spur, tibial combs not composed of short, basally-fused spinules; male styles folded inwards 5
   L.R. nearly always more than 1; front tibial spur reduced except in *Riethia* and *Pseudochironomus*; tibial combs composed of short, basally fused spinules; male styles always directed rigidly backwards. . . . . Chironominae
5. R_{4+5} completely fused with the thickened costa to form a "clavus" and with a false vein running close to anterior margin on outer half of wing . Corynoneurinae
   Wing veins not like this 6
6. Pronotum scarcely divided; anepisternum with a well-formed horizontal suture; male antennae normally plumose . . . . Orthocladiinae
   Pronotal lobes widely separated; anepisternal suture obsolete; male antenna not plumose . . . . Clunioninae

SUBFAMILY TANYPODINAE

Base of M_{3+4} present (m-cu of Edwards and other authors), vein R_2 present as a fork at the end of R_{2+3}, though occasionally in some small species of *Pentaneura* the whole of vein R_{2+3} may be crowded out by the close approximation of R_1 and

R_{4+5}. Male antenna with 15 segments, the fifteenth being formed at the apex of the elongated fourteenth ; female antenna with 11–15 segments. Male hypopygium with styles folding inwards and each carrying a distinct spine at the apex or near it, coxites usually lacking inner lobes or appendages.

Anatopynia is the dominant genus of the subfamily in the New Zealand fauna, eight species being known to me. Apart from this genus, the only other representatives of the group so far known are two species of *Pentaneura*.

Key to New Zealand Genera of Tanypodinae

Female antenna with 11–13 segments, costa not produced . . *Pentaneura* Philippi
Female antenna with 15 segments, costa distinctly produced beyond apex of R_{4+5}
Anatopynia Johannsen

Genus ***PENTANEURA*** Philippi

Pentaneura Phillipi, 1865, *Verh. Zool.-bot. Ges. Wien* **15** : 629 ; Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 287 ; Johannsen, 1946, *Journ. New York ent. Soc.* **54** : 267–289 ; Freeman, 1955, *Bull. Brit. Mus.* (*nat. Hist.*) (*Entom.*) **4** : 20.
Isoplastus Skuse, 1889, *Proc. Linn. Soc. N. S. Wales* (2) **4** : 279 (nec *Isoplastus* Horn, 1880, *Trans. Amer. ent. Soc.* **8** : 277—Coleoptera).
Ablabesmyia Johannsen, 1905, *Bull. N. Y. State Mus.* **86** : 135.
Tanypus (Meigen) Hutton, 1901, *Trans. New Zealand Inst.* **34** : 186 (in part).

Wings densely hairy and often with a pattern of dark macrotrichia with or without staining on the membrane ; costa not produced, R_2 normally present, base of M_{3+4} placed immediately beyond the posterior fork. Antenna of female with 11–13 segments. Pronotum more reduced than in other genera of the subfamily. No tarsal spurs, pulvilli usually absent.

In my study of the African species (1955) I recognized two subgenera, *Pentaneura* and *Ablabesmyia*. Fittkau (1957, *Arch. Hydrobiol.* **53** : 313–322) does not seem to accept this division but he has erected two distinct genera for the species groups of my subgenus *Pentaneura* that show hypopygial differences between the species. He has named these two genera *Thienemannimyia* and *Conchapelopia*. The main differences between the genera recognized by him appear to be in the male hypopygium but he gives as additional characters the spur shape which is very difficult to see and appreciate and the presence in *Conchapelopia* of tiny mesonotal protuberances. However, this latter character is also present in some species of *Pentaneura sensu stricto* such as *P.* (*P.*) *rutshuruiensis* Goetghebuer and *teesdalei* Freeman (both from Africa south of the Sahara), a fact which tends to invalidate the definition. I still prefer to adhere to the classification which I adopted in 1955.

Key to New Zealand Subgenera and Species of *Pentaneura*

Tibiae without black rings, wings unmarked in the single New Zealand species, prescutellar area not well marked, acrostichal bristles running right across it
Pentaneura s. str. only one species—*harrisi* sp. n.
Tibiae with three well-defined black rings, wings with pattern of patches of dark macrotrichia, prescutellar area sharply defined, more or less circular and with acrostichal bristles diverging around it
Ablabesmyia Johannsen, only one species—*malus* Hutton

Pentaneura (Pentaneura) harrisi sp. n.

Yellowish, mesonotal stripes brownish and separate, abdominal segments with brown bands in the basal halves, wings and legs unmarked. This species is closely allied to the European species *brevitibialis* Goetghebuer but it differs slightly in colour and I have preferred to treat it as separate.

Male. Wing length 2 mm.

Head and mouthparts brownish, antennal pedicel dark brown, A.R. 1·2. *Thorax* with yellowish, pruinose background, mesonotal stripes pale brown, central pair clearly separated longitudinally, bristles brown, postnotum and sternopleuron brown. *Legs* yellowish and unmarked, anterior tarsi without beard, pulvilli absent, L.R. 0·8, middle leg ratio practically 1. *Wings* evenly and densely clothed with macrotrichia, R_{2+3} just visible, R_{4+5} ending beyond tip of M_{3+4}, anal angle rounded, halteres yellow. *Abdomen* yellowish, segments 2–5 with brown bands in basal halves but not placed at the bases, segments 6–9 brown. Hypopygium with straight and simple styles.

Female similar to male, but thorax and abdomen less clearly marked in some specimens.

Holotype male, WELLINGTON : Ohakune, xii.1922–i.1923 (*T. R. Harris*) ; further material, Ohakune, 4 ♀, x–xi.1922 and x–xi.1923 (*T. R. Harris*), holotype and others all in the British Museum. CANTERBURY : Hilltop, 1 ♂, 1 ♀, i.1925 (*A. Tonnoir*) in the Canterbury Museum.

Pentaneura (Ablabesmyia) malus Hutton

Tanypus malus Hutton, 1902, *Trans. New Zealand Inst.* **34** : 187.

Dark brown, abdomen of male whitish on basal half, legs pale with dark rings on tibiae and tarsal segments and at apex of femur, wings mottled. Very similar to the Palaearctic species *P. monilis* Linn. from which it differs in the rather more numerous and smaller wing spots.

Male. Wing length 3 mm.

Head, mouthparts and antennae brown, A.R. 1·5. *Thorax* dark brown with pruinose mottling. *Legs* yellow, femora darker basally and with an apical black band, tibiae with black bands at the base, centre and apex, all tarsal segments dark at apices, basitarsus with additional central band, L.R. 0·75. *Wings* with blackish spots at apices of R_1, R_{2+3}, R_{4+5}, on r-m cross-vein, in extreme base of posterior fork and at apex of Cu_1 ; cell R_5 with a large central grey spot and three smaller ones in outer half, cell M_2 with two spots, two further grey spots at apex and centre of vein M_{3+4}, three spots in anal cell. Halteres yellow. *Abdomen* with segments 1–5 whitish and with indistinct dark markings at their bases ; remainder of abdomen dark.

Female resembles male.

I have seen cotypes of this species both in the British Museum and from the Canterbury Museum.

DISTRIBUTION. CANTERBURY : Christchurch, 6 ♂, 9 ♀, cotypes and 1 ♂, 5 ♀, ix–xii.1924 (*A. Tonnoir*). WESTLAND : Lake Moana, 1 ♂, xii.1925 (*A. Tonnoir*).

WELLINGTON: Ohakune, 1 ♀ (*T. R. Harris*). AUCKLAND: Paiaka, 3 ♀ (*R. A. Cumber*).

Genus *ANATOPYNIA* Johannsen

Anatopynia Johannsen, 1905, *Bull. N. Y. State Mus.* **86** : 135 ; Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 297 ; Edwards, 1931, *Dipt. Pat. S. Chile.* London, **2** : 239 ; Freeman, 1955, *Bull. Brit. Mus. (nat. Hist.) Entom.* **4** : 44.

Wing membrane clothed with macrotrichia ; costa strongly produced ; R_{2+3} present and distinct ; basal section of M_{3+4} present and posterior fork just basal to this as in *Pentaneura* ; antennae of female 15-segmented ; pulvilli present or absent.

Anatopynia was first redefined and used in this sense by Edwards (1929). He divided it into three species groups :

Group A (*Anatopynia s. str.*). Wings hairy at tips only, wing markings and pulvilli absent.

Group B (*Macropelopia* Thienemann). Wings densely hairy and normally with at least a central dark spot, pulvilli absent.

Group C (*Psectrotanypus* Kieffer). Wings densely hairy, markings forming bands rather than spots, pulvilli present.

Of the ten New Zealand species that I am recognizing, all except two fall into Group B ; these two, *A. quadricincta* and *cana* fall into Group C, whilst Group A is not represented. Species of all groups are known from the Palaearctic Region ; Group B has been recorded from the Nearctic Region and there is a specimen of a species of Group C from Texas in the British Museum, so that both Groups B and C are known from the Holarctic Region. Only two other parts of the world have been treated fully in respect of this genus, namely South Chile and Argentina and Africa south of the Sahara. In the former there are ten species of Group B known (Edwards, 1931), whilst in Africa there are two typical species of Group B, one from the Cape and the other from Ruanda Urundi and Uganda, and two less typical, one having a wide distribution (Freeman, 1955). In addition there are undescribed species of Group B in the British Museum from Tibet, Kashmir, Punjab, W. Himalayas, Assam and Queensland.

Taking the ten New Zealand species into account, it seems that the genus is to be found with its greatest development in the cooler and more temperate parts of the world and that where species are found in tropical or subtropical regions they are often associated with mountainous districts.

The New Zealand species described here show a general resemblance to the Palaearctic species which is accentuated by the presence of two species belonging to Group C, a group which has not previously been recorded outside the Holarctic Region. There is also a resemblance to the South Chilean and Argentinian species shown particularly by *A. apicinella* which is very similar to *A. apicina* from Chile and Argentina.

KEY TO NEW ZEALAND SPECIES OF *Anatopynia*

1. Dark markings when present on femora, confined to apex or subapical ring, pulvilli absent 2
   Femora with a central as well as one or two subapical dark rings, small pulvilli present 9

2. Wings with a discrete dark spot on centre of stem of posterior fork (Pl. XI, fig. *a*); a dark species, wings heavily marbled, postnotum bare . . . . *antarctica* Hudson
   Wings without this dark spot, postnotum with a group of six to ten hairs . . . 3
3. Tarsal segments lacking dark tips . . . . *flavipes* sp. n.
   Tarsal segments dark at tips 4
4. Wings with well-formed pale spots in apices of cells M_1 and M_3 (Pl. XI, figs. *b–d*) . 5
   Wings without distinct pale spots here, often uniformly clouded, or more or less clear, or with discrete dark spots at apices of veins (Pl. XI, figs. *e*, *f* and Text-fig. 1, *a*) . 7
5. Dark markings on abdomen at apex of segments . . . . . . *apicincta* sp. n.
   Dark markings either basally or centrally placed on segments 6
6. M_{3+4} with an elongate dark cloud along most of its length (Pl. XI, fig. *d*), anal cell with a single large rectangular dark patch . . . . *debilis* Hutton
   This vein only dark at the tip, anal cell with two separate spots (Pl. XI. fig. *c*) *languidus* Hutton
7. Wing with five distinct dark spots as in Text-fig. 1, *a* . . . *quinquepunctata* sp. n.
   Wing without distinct dark spots at apices of veins M_{3+4} and Cu_1 8
8. Wing apex with a broad cloud which contains a dark spot near the middle of cell R_5, abdominal pattern formed of a row of three spots on each segment . *umbrosa* sp. n.
   Wing apex less distinctly clouded, no darker spot in cell R_5, abdominal pattern formed of a basal or sub-basal band on each segment, usually absent from segments 1 and 2 *apicinella* sp. n.
9. Mesonotum pruinose between the stripes, anal cell with a pale area within the dark at the tip (Pl. XI, fig. *f*), wing pattern darker; femur dark at base and with two sub-apical rings . . . . *quadricincta* sp. n.
   Mesonotum with whitish pruinosity all over, anal cell dark at the apex and without included pale area, wing pattern paler; femur pale at base and with only one sub-apical ring . . . . *cana* sp. n.

Anatopynia antarctica Hudson

Corethra antarctica Hudson, 1892, *Manual of New Zealand Entomology*. London, p. 43.
Macropelopia hudsoni Kieffer, 1921, *Ann. Soc. Linn. Lyon.* **58** : 148 (***syn. nov.***).

A dark species with evenly mottled wings, differing from other species by the presence of a small dark patch on stem of M, legs with knees darkened but without central ring, male abdomen with broad dark ring at apex of each segment and another, usually paler one basally.

Male. Wing length 3·3–3·5 mm.

Head dark grey, A.R. 1·8. *Thorax* mainly of a dark grey colour and pruinose, but three stripes can be distinguished; shoulders and lines separating stripes brown or even paler, scutellum brown, postnotum bare. *Legs* yellowish with a broad brown band at apex of femur, hairs and bristles dark; base of tibiae rather dark, apices of tibiae and tarsal segments brown; pulvilli absent, L.R. about 0·7. *Wings* (Pl. XI, fig. *a*) evenly mottled and with a dark band around most of wing tip and a dark spot in the middle of the stem of M; halteres yellow. *Abdomen* yellowish with a broad dark band at apex of each segment and another paler one basally, segments usually obscurely darkened along centre line as well.

Female very similar to male, abdomen less distinctly marked, wings more strongly marked.

The type of *Corethra antarctica* is in the Dominion Museum, Wellington and has been compared with specimens from the British Museum on my behalf by both

Dr. R. G. Ordish and Dr. Dell; type locality "New Zealand". I have seen the type female of *Macropelopia hudsoni* which is in the Deutsches Entomologisches Institut, Berlin; type locality, Wellington.

DISTRIBUTION. AUCKLAND: Mount Albert, 2 ♂, 4 ♀, xii.1916 (*A. E. Brookes*); Tamaki, 2 ♀, viii.1917 (*A. E. Brookes*); Titirangi, 1 ♂, 2 ♀, xii.1915 (*A. E. Brookes*); Pokapu, 1 ♂, i.1919 (*J. Muggeridge*); Paiaka, 9 ♀, xi–xii.1949 (*R. A. Cumber*). WELLINGTON: Ohakune, 1 ♂, 10 ♀ (*T. R. Harris*) and 1 ♂, ii.1925 (*A. Tonnoir*). WESTLAND: no locality, 3 ♀, ii.1923 (*T. R. Harris*). CANTERBURY: Governor's Bay, 1 ♀, xi.1922 (*J. F. Tapley*); Christchurch, 1 ♂, 2 ♀, xi–xii.1924 (*A. Tonnoir*); Cass, 3 ♂, 1 ♀, ii.1925 (*A. Tonnoir*); Kennedy's Bush, 1 ♂, 1 ♀, i.1925 (*A. Tonnoir*); Hilltop, 1 ♀, i.1925 (*A. Tonnoir*); S. Canterbury, 1 ♂, 11 ♀, ii.1923 (*T. R. Harris*). OTAGO: Queenstown, 1 ♀, iii.1924 (*L. Curtis*).

Anatopynia apicincta sp. n.

Thorax yellow with reddish stripes, abdomen yellow, segments with broad dark bands at apices; outer half of wing covered with dark macrotrichia with oval areas of pale ones, wing yellowish basal to cross-vein; femora dark at tips only. Easily separated from other species by the abdominal and wing patterns.

Male. Wing length 3·3–3·5 mm.

Head yellow, mouthparts and antennae brown, A.R. 1–1·5. *Thorax* with yellow background, stripes reddish, lateral ones with a dark spot posteriorly; sternopleuron and postnotum brown, scutellum with a brown spot, postnotum with a group of six to ten hairs. *Legs* yellow; knees, apices of tibiae and of tarsal segments dark brown; pulvilli absent, L.R. 0·7. *Wings* (Pl. XI, fig. *b*) with dark macrotrichia distal to cross-veins and in distal half of anal cell; this area of dark macrotrichia including pale areas as shown; halteres yellow. *Abdomen* yellow, segments 2–8 each with a broad dark band apically.

Female similar to male.

Holotype male and 15 ♂, 4 ♀, OTAGO: Alexandra (*C. C. Fenwick*). Other specimens: WELLINGTON: Ohakune, 1 ♂, 2 ♀ (*T. R. Harris*). WESTLAND: Otira, 1 ♀ (*J. W. Campbell*). CANTERBURY: White Rock, 1 ♀ (*J. W. Campbell*); Grey Mount, 1 ♀ (*J. W. Campbell*); Cass, 1 ♂, 1 ♀, ii.1925 (*A. Tonnoir*); Akaroa, 1 ♀, xii.1924 (*A. Tonnoir*). OTAGO: Queenstown, 2 ♀ (*C. C. Fenwick*); Ben Lomond, 1 ♂, 1 ♀ (*T. R. Harris*). Specimens collected by A. Tonnoir are in the Canterbury Museum, all others and holotype are in the British Museum.

Anatopynia languidus Hutton

Tanypus languidus Hutton, 1902, *Trans. New Zealand Inst.* **34**: 186.

Superficially not unlike *apicincta* but easily distinguished by the main dark abdominal band being placed basally on each segment and by the more extensive pale areas on the wings. It is quite similar to *debilis* but the anal cell has two discrete spots and there is a darkening only at base and apex of M_{3+4} and not along the stem.

Male. Wing length 3·5 mm.

Head brownish, mouthparts and antennae darker, A.R. about 1·8. *Thorax* yellowish, stripes reddish, postnotum and sternopleuron brown, postnotum with group of six to ten hairs. *Legs* yellow ; knees, apices of tibiae and of tarsal segments obscurely brown ; pulvilli absent, L.R. about 0·7. *Wings* pale and with dark patches of macrotrichia as shown in Pl. XI, fig. *c*; anal cell with two separate spots, vein M_{3+4} dark only at the base and apex. *Abdomen* yellow, segments 2–7 with a brown band basally, sometimes obscurely dark along the mid-line or with an extra rounded spot each side in the apical half of each segment.

Female similar to male, wing markings more intense as usual.

I have seen cotypes both in the British Museum and from the Canterbury Museum.

DISTRIBUTION. AUCKLAND : Paiaka, 1 ♀ (*R. A. Cumber*). WELLINGTON : Ohakune, 8 ♂, 5 ♀ (*T. R. Harris*). WESTLAND : Lake Moana, 3 ♂, 4 ♀, xii.1925 (*A. Tonnoir*). CANTERBURY : Christchurch, 1 ♂, 4 ♀, cotypes ; Cass, 3 ♂, ii.1925 (*A. Tonnoir*). OTAGO : Queenstown, 1 ♂ (*L. Curtis*) ; Alexandra, 4 ♂, 2 ♀ (*C. C. Fenwick*).

Anatopynia debilis Hutton

Tanypus debilis Hutton, 1902, *Trans. New Zealand Inst.* **34** : 186.
Macropelopia novae-zelandiae Kieffer, 1921, *Ann. Soc. Linn. Lyon.* **58** : 147 (***syn. nov.***).

Superficially this species is very similar to *languidus* but it differs in the wing markings and in the pruinose thorax which is paler and which tends to have a cross-banded appearance. I have seen the holotype of *novae-zelandiae* and can confirm the synonymy.

Male. Wing length 3·5 mm.

Head and antennae yellowish, mouthparts brown, A.R. about 1·6. *Thorax* with yellowish white pruinose background ; stripes reddish yellow, postnotum and sternopleuron browner ; median mesonotal stripe darker posteriorly and lateral stripes darker anteriorly giving thorax a cross-banded appearance ; all thoracic hairs pale, postnotum with a group of six to ten hairs. *Legs* yellowish white, darkened narrowly immediately above and below the knees and at apices of tibiae and of tarsal segments, pulvilli absent, L.R. 0·7. *Wings* (Pl. XI, fig. *d*) with more extensive dark haired areas than *languidus*, anal cell with one large dark spot which leaves base and apex clear, M_{3+4} dark for most of its length. *Abdomen* yellow, segments 2–6 each with an obscure brown band at about the centre, each band darker centrally and laterally.

Female resembles male, abdominal markings virtually absent.

I have seen cotypes of *debilis* from the Canterbury Museum (type locality, Christchurch) and the holotype of *novae-zelandiae* which is in the Deutsches Entomologisches Institut, Berlin (type locality " New Zealand ").

DISTRIBUTION. AUCKLAND : Waitomo Caves, 1 ♀ (*C. L. Edwards*). WELLINGTON : Ohakune, 5 ♂, 7 ♀ (*T. R. Harris*). WESTLAND : Lake Moana, 1 ♂, xii.1925 (*A. Tonnoir*). CANTERBURY : White Rock, 3 ♂ (*J. W. Campbell*) ; Christchurch, 1 ♂, 2 ♀ cotypes of *debilis*, 1 ♂ (*J. W. Campbell*) and 2 ♂, 1 ♀, ix–x.1924 (*A. Tonnoir*) ; Dean's Bush, 2 ♂, x.1924 (*A. Tonnoir*).

Anatopynia quinquepunctata sp. n.

A rather small species, readily recognized by the wing pattern of five dark spots, one being in anal cell and two others at apices of M_{3+4} and Cu_1.

Male. Wing length 2·5 mm.

Head yellowish, mouthparts and antennae brown, A.R. about 1. *Thorax* reddish brown and shining, shoulders and anterior parts of pleura yellow; postnotum with group of hairs at apex. *Legs* yellow, knees rather broadly dark, apices of tibiae and of tarsal segments brown, pulvilli absent, L.R. about 0·6. *Wings* (Text-fig. 1, *a* of female) with five dark spots formed of dark macrotrichia on slightly stained patches, a single one in anal cell and rounded ones at apices of M_{3+4} and Cu_1, extreme apex of wing pale. *Abdomen* yellow, segments 3–5 with narrow sub-basal dark bands, 6–7 more generally darkened.

Female similar to male in general but wings more distinctly patterned and abdomen more uniformly banded.

Holotype male and 2 ♀, CANTERBURY: Cass, xi.1924 (*A. Tonnoir*); holotype returned to the Canterbury Museum, one female in the British Museum.

Anatopynia flavipes sp. n.

A small brownish species, thorax pruinose, tarsal segments not dark at apices, wing pattern fainter than in some other species, pale areas tending to form three cross-bands.

Male. Wing length 2 mm.

Head, mouthparts and antennae pale brown, A.R. about 1·4. *Thorax* fairly uniformly brown, mesonotum pruinose, postnotum with a group of hairs at apex. *Legs* yellow, tibiae slightly darker at tips, tarsi undarkened even at tips of segments, pulvilli absent, L.R. 0·7. *Wings* (Text-fig. 1, *b* of female) greyish white with pale

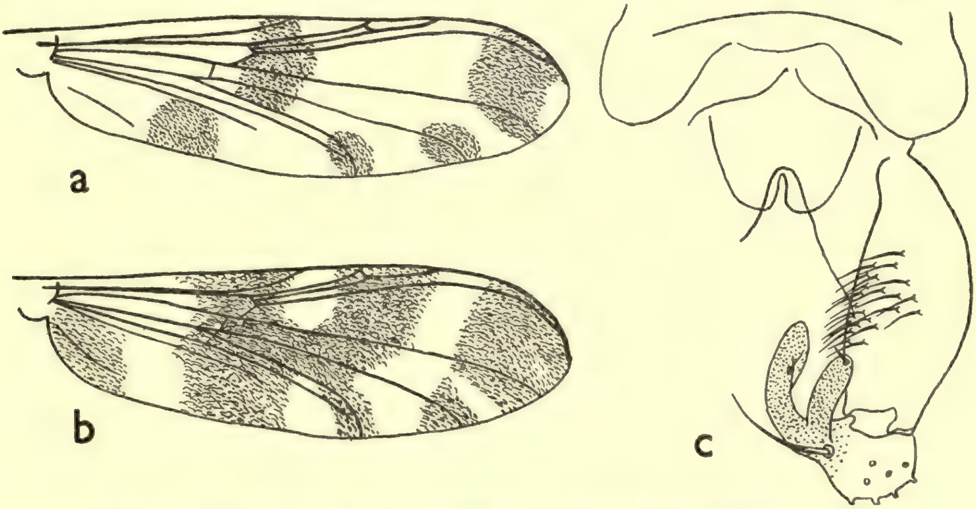

FIG. 1. *Anatopynia* and *Podonomus*. (*a*) Wing of *A. quinquepunctata*; (*b*) wing of *A. flavipes*; (*c*) hypopygium of *P. ohakunensis*.

areas as shown, the effect being of three pale cross-bands ; halteres pale. *Abdomen* brown, not distinctly banded.

Female similar to male, wing markings a little more distinct.

Holotype male and 1 ♀, WESTLAND : Lake Moana, xii.1925 (*A. Tonnoir*) ; holotype returned to the Canterbury Museum.

Anatopynia apicinella sp. n.

Mesonotum reddish, femora practically unmarked, wings with a more or less distinct median dark transverse band and sometimes a slightly darkened apex ; abdomen of male pale and with dark central or basal bands on segments 3–7 or 2–7. At first glance this species might be placed in *Pentaneura*, but the produced costa and 15-segmented female antennae show that *Anatopynia* is the correct genus. It is very similar to *A. apicina* Edwards from South Chile and Argentina but it differs in the more basal placing of the dark bands on the abdominal segments, by the pale knees and feebler wing markings. It is also not unlike *A. nugax* Walker from the Palaearctic Region.

Male. Wing length 3–3·5 mm.

Head, antennae and mouthparts yellowish, A.R. 1·5. *Thorax* with shining reddish scutum ; postnotum and sternopleuron brown, postnotum with group of six to eight hairs. *Legs* yellow, knees practically unmarked, apices of tibiae and of tarsal segments darkened ; pulvilli absent, L.R. 0·6. *Wings* with cross-veins darkened and with a median band of dark macrotrichia mainly distal to cross-veins but extended in anal cell, apical quarter of wing may also be vaguely darkened ; wing markings variable in intensity, often very faint ; halteres yellow. *Abdomen* yellowish white, segments 1 and 2 usually plain, 3–5 with a dark band in basal half, 6–7 brown, but segment 2 may possess a dark band in some specimens and there may be a faint central darkening along most of abdomen.

Female with thorax, leg and wing pattern similar to male, abdomen more or less unmarked, reddish.

Holotype male and 29 ♂, 21 ♀, WELLINGTON : Ohakune (*T. R. Harris*) all in the British Museum. Further specimens in the Canterbury Museum : WESTLAND : Lake Moana, 2 ♂, 2 ♀, xii.1925 (*A. Tonnoir*). CANTERBURY : Cass, 2 ♂, 1 ♀, xi.1924–ii.1925 (*A. Tonnoir*).

Anatopynia umbrosa sp. n.

Mesonotum whitish yellow with reddish brown stripes ; legs usually darkened at the knees ; wings with a central and apical band much as in *apicinella* though much more pronounced, especially in the female, differing by the presence of a patch of black hair in the centre of cell R_5 ; abdominal pattern formed of transverse row of dark spots on each segment ; female very bulky and the whole insect is much larger than *apicinella*.

Male. Wing length 4·5 mm.

Head, mouthparts and antennal pedicel brown, flagellum missing. *Thorax* with whitish yellow background, mesonotal stripes reddish brown with browner markings especially centrally and posteriorly, sternopleuron and postnotum dark brown, the latter with hair patch. *Legs* yellowish brown and with a brown ring above and below each knee, apices of the tibiae and of tarsal segments brown, pulvilli absent, L.R. 0·6. *Wings* much less well marked than in the female (Pl. XI, fig. *e*), cross-veins brown clouded, apex faintly clouded and with indications of dark hair patches one below apex of R_3 in cell R_5 and one in anal cell; halteres yellow. *Abdomen* yellow, segments 2–7 each with a transverse row of three spots placed at the middle of the segment; the central spots are blacker, nearly circular and carry tufts of black hair; the lateral spots are brown, oval, without conspicuous hair tufts and reach to the lateral margins; segment 8 and hypopygium brown.

Female resembles male in colour of head, thorax, legs and abdomen, although abdominal spots less conspicuous; wings much more strongly marked, as in the figure. Cross-veins with a strong brown stain, widening anteriorly and extending along costa as a yellow stain, also widening but much fainter in anal cell where it includes a dark hair patch. Apical third of wing also brown stained and including a dark hair patch in the centre of cell R_5 and another in cell M_2; wing also stained at the base.

Holotype female and another female, WELLINGTON: Ohakune (*T. R. Harris*). OTAGO: Queenstown, 2 ♂ (*L. Curtis*); Paradise, 1 ♀ (*C. C. Fenwick*). CANTERBURY: Upper Hororata, 1 ♀, i.1922 (*G. Archey*). The last specimen is in the Canterbury Museum, holotype and remainder in the British Museum.

Anatopynia quadricincta sp. n.

Mesonotum yellowish with reddish stripes, pruinose only between the stripes, patch of hair above wing base black, as usual; femora with basal, central and two subapical dark bands; wings with heavy pattern, more or less as two bands, apex of anal cell with clear area, wing apex with row of four dark-haired areas more or less set in pale areas, pale area basal to r-m cross-vein comparatively small; abdomen with pattern of transverse rows of three spots, central one with tufts of black hairs.

This species and the next one differ from the other New Zealand species by the presence of an extra dark band on the femora and the possession of small pulvilli; the wing pattern also tends to be more in the form of bands. They resemble *umbrosa* in the arrangement of the dark spots on the abdomen, but are obviously more allied to the European species *varia* Fabricius and *trifascipennis* Zetterstedt. The two species are easily separated by the thoracic pruinosity and details of leg and wing pattern, as well as by the darker colour of *quadricincta*.

Male. Wing length 3·5–4·5 mm.

Head yellowish brown, mouthparts and antennae darker, A.R. 1·6. *Thorax* yellow, stripes reddish, darker posteriorly, mesonotum pruinose between the stripes and in prescutellar area, sternopleuron and postnotum dark brown, the latter with hair patch; hair patch immediately anterior to wing base black. *Legs* yellowish, femora with basal, central and two subapical brown bands, tibiae with sub-basal and apical brown bands, apices of tarsal segments brown; L.R. 1·6, small pulvilli present. *Wings* (Pl. XI, fig. *f* of female) with two main dark bands and an apical dark area ; the diagnostic features are the more or less ocellated spots in the outer half of the wing, the presence of a pale area at the apex of the anal cell in addition to the one just basal to this and the small size of the pale spot immediately basal to r-m. Halteres yellow. *Abdomen* yellow, segments 2–7 each with a transverse row of spots, the central ones blacker and with tufts of black hair, lateral ones brown and oval.

Female very similar to male.

Holotype male and 6 ♂, 18 ♀, WELLINGTON : Ohakune (*T. R. Harris*). AUCKLAND : Hunua Ranges, 1 ♂ (*A. E. Brookes*). WESTLAND : Lake Moana, xii.1925 (*A. Tonnoir*). CANTERBURY : Christchurch, R. Purau, 1 ♂, 1 ♀ (*J. W. Campbell*) ; Christchurch, 1 ♀, xii.1924 (*A. Tonnoir*). Specimens collected by Tonnoir are in the Canterbury Museum, holotype and remainder are in the British Museum.

Anatopynia cana sp. n.

Resembles *quadricincta* but paler, mesonotum with whitish pruinosity all over, hair patch anterior to wing base pale ; femora with only central and single subapical brown bands ; wing without the second pale area at the apex of the anal cell and apical markings more indefinite.

Male. Wing length 3·5 mm.

Head yellow and pruinose, antennae brown, A.R. about 1·8. *Thorax* pale reddish yellow, pro- and mesothorax covered with whitish pruinosity, mesonotal stripes visible because of changing appearance of pruinosity with changes in light direction ; hair patch anterior to wing base pale ; postnotum and sternopleuron reddish and less pruinose, postnotum with hair patch. *Legs* yellowish white, femora pale at base but with central and single subapical brown rings, tibiae with brown sub-basal ring, apices of tibial and tarsal segments brown ; L.R. 1·6, small pulvilli present. *Wings* not unlike *quadricincta* in pattern, but apex much paler and lacking any definite spots, apex of anal cell dark, pale spot basal to cross-vein larger. Halteres yellow. *Abdomen* whitish and with basic pattern similar to *quadricincta* but with spots all brown and much less distinct.

Female similar to male, abdominal spots rather darker.

Holotype male and 2 ♂, 5 ♀, WELLINGTON : Ohakune (*T. R. Harris*), all in the British Museum.

SUBFAMILY PODONOMINAE

The Podonominae differ from the Tanypodinae because (1) although the base of M_{3+4} is present, R_{2+3} is completely absent even though the two radial veins are well separated ; (2) the postnotum is short and rounded and has no trace of a median furrow ; and (3) at rest the wings are superposed over the back as in the Ceratopogonidae. The subfamily is represented in the material available to me by a single species of *Podonomus* allied to, and possibly a form of, *P. kiefferi* Garrett (*peregrinus* Edwards).

Genus ***PODONOMUS*** Philippi

Podonomus Philippi, 1865, *Verh. Zool.-bot. Ges. Wien* **15** : 691 ; Edwards, 1931, *Dipt. Pat. S. Chile.* London, **2** : 252 ; Edwards, 1937, *Int. Rev. Hydrobiol.* **35** : 100 ; Wirth, 1952, *Rev. Chil. Ent.* **2** : 93.

The following definition is taken from Edwards (1931) : eyes reniform, antennae of male more or less plumose, with 15 segments, penultimate segment longer than last ; antennae of female with 10–14 segments. Pronotum reduced and not visible from above, postnotum small and rounded and lacking furrow. Wings with R_1 simple in male but swollen apically in female, costa produced, true base of M_{3+4} a little beyond posterior fork, squama with long fringe.

Podonomus ohakunensis sp. n.

Uniformly brown, A.R. 0·75, female antennae with 12 segments, mesonotum with long yellow hairs on anterior part, wings densely hairy, male hypopygium with forked styles, the two branches more or less equal. This species is extremely similar to *P. kiefferi* Garrett, from which it may be distinguished by the two branches of the male styles being practically equal. It may prove to be the New Zealand form of this widespread species.

Male. Wing length 2 mm.

Head, mouthparts and antennae dark brown, eyes bare, A.R. 0·75. *Thorax* dark brown, slightly pruinose and with long yellow hair on the anterior part especially on the shoulders, dorso-central bristles irregularly triserial. *Legs* brown, L.R. 0·6, pulvilli absent, fourth tarsal segment shorter than the fifth, no tarsal segments swollen, spurs of middle tibiae as in *kiefferi*, i.e. rather short and thin and not very unequal. *Wings* densely hairy, similar to *kiefferi*, halteres brown. *Abdomen* dark brown with long yellow hair ; hypopygium (Text-fig. 1, *c*) with the two branches of the styles subequal and both rounded at the apex (in *kiefferi* one is longer and more or less pointed).

Female similar to male in general colour, structure and hairiness, wings with R_1 swollen, antennae with 12 segments.

Holotype male and 46 ♀, WELLINGTON : Ohakune, v–vii.1923 also 1 ♂, 2 ♀, x–xi.1922 (*T. R. Harris*). WESTLAND : Lake Moana, 2 ♂, 2 ♀, xii.1925 (*A. Tonnoir*). CANTERBURY : Governor's Bay, 1 ♀, viii.1923 (*J. F. Tapley*). OTAGO : Queenstown, 1 ♂, ix.1923 (*L. Curtis*). Specimens collected by Tonnoir are in the Canterbury Museum, remainder and holotype are in the British Museum.

SUBFAMILY DIAMESINAE

The Diamesinae occupy a position intermediate between the Tanypodinae and Orthocladiinae and may be defined as follows :

Male antennae usually with 13–14 segments, occasionally reduced to as few as six, there are traces of a fifteenth segment in *Protanypus*. Female antennae with six to eight segments except in *Protanypus* where there are 14. Pronotum well developed. Base of M_{3+4} present, R_{2+3} present and distinct and ending in costa well beyond R_1

to which it is not connected, R_2 absent. Male hypopygium with infolded styles, coxite often with inner lobes.

Two genera of this subfamily, each with a single included species, are known from New Zealand. Neither genus is recorded from elsewhere and both are quite distinct. There are representatives of both in the British Museum and of one in the Canterbury Museum.

Key to New Zealand Genera and Species of Diamesinae

Wing length 2–2·5 mm., pronotum with forwardly projecting lobes, mesonotum densely clothed with short erect hairs except on the stripes, the pits of these hairs giving a rugose appearance to the surface . . *Lobodiamesa campbelli* Pagast

Wing length 3·5–4 mm., pronotum large as usual but without forwardly projecting lobes, mesonotum with only the usual three rows of hairs, surface not rugose *Maoridiamesa harrisi* Pagast

Genus ***LOBODIAMESA*** Pagast

Lobodiamesa Pagast, 1947, *Arch. Hydrobiol.* **41** : 446.

Eyes reniform and pubescent, female antenna with six segments ; each half of pronotum with a flat, more or less rectangular, forwardly projecting lobe at the inner edge. Mesonotum densely clothed, except on the stripes, with short erect hairs arising from large pits, which practically touch and give a rugose appearance to the shoulders, prescutellar area, a broad area of the lateral margin and a broad band about five pits wide between lateral and central stripes. Fourth tarsal segment strongly heart-shaped, hardly longer than wide. Wings with neither macrotrichia nor distinguishable microtrichia on the membrane ; costa produced, R_{2+3} running rather close to R_{4+5}, r-m more or less transverse, base of M_{3+4} basal to posterior fork.

This is a distinctive and easily recognized genus because of the hairy eyes, pronotal lobes, rugose mesonotum and strongly heart-shaped fourth tarsal segment. Only one species is known which is automatically the type species.

Lobodiamesa campbelli Pagast

Lobodiamesa campbelli Pagast, 1947, *Arch. Hydrobiol.* **41** : 446.

The type series was never returned by Pagast to the British Museum and was apparently destroyed during the Second World War. Fortunately not the entire series had been sent to him and four females remain in the Museum, though these of course are not type material.

It is a small species, wing length 2–2·5 mm., antennae and prothoracic lobes pale in the female, thorax dark brown, stripes blackish, abdomen in female more or less green, sometimes browner dorsally, in male blackish ; legs brown, femora paler. The male hypopygium is figured by Pagast.

Type locality Nelson : Blackball.

Distribution. Wellington : Ohakune, 4 ♀ (*T. R. Harris*) in the British Museum.

Genus **MAORIDIAMESA** Pagast

Maoridiamesa Pagast, 1947, *Arch. Hydrobiol.* **41** : 448.

Eyes rounded above, densely pubescent, female antenna with seven segments. Pronotum large but normal; mesonotum with the usual rows of hairs only. Fourth tarsal segment of front leg subequal to fifth, bilobed at apex, on other legs shorter than fifth and heart-shaped. Wing membrane with distinguishable microtrichia; costa produced, R_{2+3} running mid-way between R_1 and R_{4+5}, r-m long and curved, base of M_{3+4} basal to posterior fork.

In wing venation this genus is not unlike *Prodiamesa*, although r-m is longer, but the rounded hairy eyes and heart-shaped fourth tarsal segment preclude its being placed there. In these characters it is closer to *Diamesa*. The genus is only known from New Zealand, where it is represented by a single species which automatically becomes the type of the genus.

Maoridiamesa harrisi Pagast

Maoridiamesa harrisi Pagast, 1947, *Arch. Hydrobiol.* **41** : 448.

This is a larger species than *Lobodiamesa campbelli*, with wing length 3·5–4 mm. The male is dark, almost blackish but brown on the shoulders and scutellum; the female thorax is yellowish brown with separate brown stripes. The male hypopygium is figured by Pagast.

As with *Lobodiamesa* the type series was not returned to the British Museum and was probably destroyed during the Second World War. However, 1 ♂ and 7 ♀ taken at the type locality of WELLINGTON : Ohakune (*T. R. Harris*) were retained in the Museum.

DISTRIBUTION. Besides British Museum material from the type locality, there are specimens as follows in the Canterbury Museum : CANTERBURY : Cass, 1 ♀, xii.1924 (*A. Tonnoir*); Hilltop, 1 ♂, 1 ♀, i.1925 (*A. Tonnoir*).

SUBFAMILY ORTHOCLADIINAE

True base of M_{3+4} (m-cu of authors) absent, R_{2+3} never connected to R_1 by a cross-vein, R_{4+5} not fused with costa to form a clavus. Eyes typically reniform, seldom with dorsal narrow portion; male antenna with 14 segments, of female with five to seven. Postnotal furrow distinct, anepisternal suture well developed; anterior tibia always with a distinct spur, anterior basitarsus always shorter than tibia. Hypopygium not inverted, styles movable and folded inwards in repose.

This subfamily is especially typical of cooler water habitats and is more abundant in the temperate and colder parts of the world. It is not well represented in the New Zealand material at my disposal and there may be considerably more New Zealand species than I have seen. I am not able to describe all the species represented in the collections because several are only present as females and without a figure or description of the male hypopygium and wing the species are not easily recognized again.

I am using the classification given in my " Study of the African Chironomidae, Part II" (1956, *Bull. Brit. Mus.* (*nat. Hist.*) *Entom.* **4** : 287–368). The key given below gives the genera so far known from New Zealand and includes the genus *Limnophyes* because, although I am not describing the species, I wish to place it on record that there is a female of a species of that genus in the British Museum.

KEY TO NEW ZEALAND GENERA OF SUBFAMILY ORTHOCLADIINAE

1. Wing membrane bearing macrotrichia at least at apex . . . . *Metriocnemus* Wulp
   Wing membrane without macrotrichia 2
2. Eyes densely pubescent 3
   Eyes bare 6
3. Dorso-central hairs minute and decumbent, tibiae often with white rings or completely white, male styles simple . . . . *Cricotopus* Wulp
   Dorso-central hairs erect and normal 4
4. Male styles more or less double, wings with dark markings and with distinguishable microtrichia . . . . *Diplocladius* Kieffer
   Male styles simple, wings plain and without microtrichia when examined with a 1/6-in. objective 5
5. Squama fringed . . . . *Trichocladius* Kieffer
   Squama bare . . . . *Smittia* Holmgren (in part)
6. Wing membrane with microtrichia distinguishable under a 1/6-in. objective or lesser magnification, membrane colourless by transmitted light 7
   Wing membrane without distinguishable microtrichia, usually at least slightly brownish by transmitted light 8
7. Cu_1 strongly bent near middle, posterior fork well beyond r-m, anal lobe reduced *Limnophyes* Eaton
   Cu_1 not strongly bent, often almost straight, posterior fork only slightly beyond or below r-m; anal lobe present . . . . *Chaetocladius* Kieffer
8. Squama fringed . . . . *Orthocladius* Wulp
   Squama bare . . . . *Smittia* Holmgren (in part)

Genus ***METRIOCNEMUS*** Wulp

Metriocnemus van der Wulp, 1874, *Tijdschr. Ent.* **17** : 136 ; Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 310, Freeman, 1956, *Bull. Brit. Mus.* (*nat. Hist.*) *Entom.* **4** : 294.

Wings with macrotrichia on membrane at least at tip, cross-vein r-m rather short, pulvilli absent, scutum not produced in front, male styles not bifid. There is a single New Zealand species of this world-wide genus in the British Museum and a female of another in the Canterbury Museum ; I am not able to describe the latter until a male is available.

Metriocnemus lobifer sp. n.

A small brown species falling Group F of Edwards (1929) classification, not unlike the Palaearctic species *subnudus* and *brumalis* Edwards, but easily distinguished by the male hypopygium with its large coxite lobe and broader styles ; A.R. 0·5, L.R. 0·8, costa produced, Cu bent, wings not densely hairy, squama bare, anal point absent.

Male. Wing length 1·8 mm.

Head, mouthparts and antennae brown, eyes bare, dorsal narrow portion absent, A.R. 0·5. *Thorax* brown, dorso-central bristles more or less uniserial, pits yellowish.

Legs yellowish brown, L.R. about 0·8, of posterior legs about 0·6. *Wings* with a yellowish tinge, membrane with macrotrichia on apical half and in anal cell, squama bare; costa produced for half width of cell R_5, R_{4+5} ending rather distal to tip of M_{3+4}, Cu strongly bent. Halteres with brown knobs. *Abdomen* brown; hypopygium (Text-fig. 2, *a*) lacking anal point, coxites with large, free, inner lobe, styles more or less rectangular.

Female similar to male; wings sparsely hairy in basal half, antennal segments 3–5 with short necks, segment 6 one and a half times as long as 5.

Holotype male WELLINGTON: Ohakune, v–vii.1923 (*T. R. Harris*). OTAGO: Leith Valley, Dunedin, 5 ♀, viii.1922 (*G. Howes*). Holotype and other specimens all in the British Museum.

Genus ***CRICOTOPUS*** Wulp

Cricotopus van der Wulp, 1874, *Tijdschr. Ent.* **17**: 132; Edwards, 1929, *Trans. ent. Soc. Lond.* **77**: 317; Freeman, 1956, *Bull. Brit. Mus. (nat. Hist.) Entom.* **4**: 303.
Orthocladius Hutton, 1902, *Trans. New Zealand Inst.* **34**: 183 (in part).

Eyes densely pubescent; humeral pits small, dorso-central hairs minute and decumbent, the punctures from which they arise scarcely visible under a binocular microscope; abdomen often with yellow markings, hypopygium and female cerci often white; hypopygium lacking anal point; tibiae, especially anterior pair, often with a broad white ring; wings without visible microtrichia; squama fringed.

KEY TO NEW ZEALAND SPECIES OF *Cricotopus*

Anterior and middle tibiae with white ring in basal half . .	*zealandicus* sp. n.
All tibiae uniformly brown	*cingulatus* Hutton

Cricotopus zealandicus sp. n.

Scutum shining, stripes partially fused, shoulders yellow, legs with white bands on at least front and middle tibiae, pulvilli absent, abdomen yellow on segment 1 and parts of 2, 4 and 5 and hypopygium. This species is very similar to the Palaearctic species *triannulatus* Macquart but shows differences in leg colour and in hypopygial structure.

Male. Wing length 2·3–2·5 mm.

Head yellowish brown, mouthparts and antennae blackish, A.R. about 1·2, eyes densely pubescent. *Thorax* shining and with yellow background; stripes black and more or less fused but brown at points of fusion and in prescutellar area; scutellum, postnotum and sternopleuron black. *Legs* blackish or brown, anterior pair darker than others, anterior and middle tibiae with a white ring in basal half, this ring is sometimes present also on posterior tibia; pulvilli absent, L.R. 0·8. *Wings* normal for the genus. *Abdomen* black with yellow markings; segment 1 completely yellow, 2 yellow on basal half, 3 black, 4 and 5 yellow on basal two-thirds, remainder black except for hypopygium which is yellow. Hypopygium without anal point, inner lobe of coxite not free but low and oval, styles of even width and with a triangular point near the apical spine.

Female. Antennae with seven segments, thorax paler than in male, stripes smaller, browner and well separated, leg markings distinct on all legs, abdomen with segments 4 and 5 almost completely yellow, cerci whitish.

Holotype male, WELLINGTON: Ohakune, iii.1923 (*T. R. Harris*). AUCKLAND: Okarahia, 1 ♂, ii.1925 (*A. Tonnoir*). WELLINGTON: Ohakune, 6 ♂, 16 ♀, iv–vii and ix–xi.1923 (*T. R. Harris*). CANTERBURY: Cass, 2 ♂, ii.1925 (*A. Tonnoir*); Akaroa, 2 ♀, xii.1924 (*A. Tonnoir*). OTAGO: Alexandra, 2 ♂ (*C. C. Fenwick*). All specimens collected by Tonnoir are in the Canterbury Museum, holotype and remainder in the British Museum.

Cricotopus cingulatus Hutton

Orthocladius cingulatus Hutton, 1901, *Trans. New Zealand Inst.* **34**: 184.

From the description it is clear that this is a species of *Cricotopus* and Dr. Pilgrim has confirmed this by comparing the solitary type specimen with material sent to him by me. It is similar to *zealandicus*, but is darker, the thoracic stripes are more fused and the abdominal bands narrower. The main point of difference lies in the complete absence of white tibial rings, the tibiae being uniformly brown. The hypopygia of the two species are very similar.

Type locality Christchurch, type male in the Canterbury Museum.

DISTRIBUTION. WELLINGTON: Ohakune, 4 ♂, 9 ♀ (*T. R. Harris*). NELSON: Nelson, 1 ♀, ix.1923 (*A. Tonnoir*).

Genus ***TRICHOCLADIUS*** Kieffer

Trichocladius Kieffer, 1906, *Mém. Soc. sci. Brux.* **30**: 356; Edwards, 1929, *Trans. ent. Soc. Lond.* **77**: 328 (as subg. of *Spaniotoma*); Freeman, 1956, *Bull. Brit. Mus. (nat. Hist.) Entom.* **4**: 313.

Eyes pubescent; scutum usually shining, dorso-central bristles large and erect, humeral pits unusually large in most species; wing membrane without either macrotrichia or distinguishable microtrichia, squama with complete fringe, R_{2+3} ending near mid-way between R_1 and R_{4+5}.

Only one species from New Zealand is known to me in this genus.

Trichocladius pluriserialis sp. n.

Male black except for shoulders, female with stripes more or less separated, prothorax silvery, pulvilli and anal point absent. This species is extremely similar to the African species *micans* Kieffer from which it may be separated by the bi- or tri-serial dorso-central bristles which form quite broad bands.

Male. Wing length 2–2·5 mm.

Head and mouthparts brown, antennae blacker, eyes densely pubescent, A.R. 1·5. *Thorax* blackish, slightly paler at the wing bases and on the shoulders, pronotum silvery; humeral pits conspicuous but not as large as in some species of the genus, dorso-central bristles bi- or tri-serial, their pits forming broad and conspicuous bands. *Legs* dark brown, trochanters yellow, pulvilli absent, L.R. 0·5. *Wings* normal for the genus, halteres yellow. *Abdomen* uniformly dark brown, hair pits conspicuous. Hypopygium without anal point, coxite lobe moderately developed, this and the style similar to the African species *micans* Kieffer.

Female similar to male in general features, antennae with seven segments, thoracic stripes may be partially or completely separate.

Holotype male CANTERBURY: Christchurch, R. Purau, x.1922 (*J. W. Campbell*). AUCKLAND: Paiaka, 3 ♀, xi–xii.1949 (*R. A. Cumber*). WELLINGTON: Ohakune, 2 ♂, 2 ♀, xi.1922 and iii–iv.1923 (*T. R. Harris*). CANTERBURY: Christchurch, 3 ♂, 2 ♀, vii–ix.1924 (*A. Tonnoir*); Governor's Bay, 1 ♀, ix.1922 (*J. F. Tapley*); Cass, 1 ♂, 1 ♀, xi.1924 (*A. Tonnoir*); South Canterbury, 3 ♀, ii.1923 (*T. R. Harris*). Specimens collected by Tonnoir are in the Canterbury Museum, holotype and remainder are in the British Museum.

Genus ***DIPLOCLADIUS*** Kieffer

Diplocladius Kieffer, 1908, *Zeit. InsektenBiol.* **4**: 6; Edwards, 1929, *Trans. ent. Soc. Lond.* **77**: 328 (as subg. of *Spaniotoma*); Brundin, 1956, *Inst. Freshw. Res. Drottningholm*, Rept. No. **37**: 70.

Stictocladius Edwards, 1931, *Dipt. Pat. S. Chile.* London **2**: 279 (as subg. of *Spaniotoma*).

Eyes with short but dense pubescence. Dorso-central bristles distinct, uniserial; tibial spurs well developed, the outer one of the hind tibia about half as long as the inner, pulvilli absent; wing membrane with distinguishable microtrichia, macrotrichia absent, costa slightly produced, squama often bare, when fringe present then more or less reduced. Male hypopygium with styles either double or more or less double, apex of style without spine.

Diplocladius was erected for a Palaearctic species, *D. cultrifer* Kieffer and *Stictocladius* for species from Patagonia and South Chile. The only real difference appears to lie in the leg and wing markings of the South American species which can hardly count as of generic significance; they also possess some hairs on the squama, but not a complete fringe. Of the New Zealand species described below, one (*D. pictus*) has plain legs and bare squama and can thus in some ways be regarded as a link between the European and Patagonian species. It lends support to Brundin's view that *Stictocladius* should be treated as a synonym of *Diplocladius*. This species in wing venation and general appearance is very similar to species formerly placed in *Smittia* and the wing pattern is not unlike that of *S. maculipennis* Goetghebuer from Africa. There are also African species, such as *S. hamata* Freeman, with hypopygium from which that of *Diplocladius pictus* could easily be derived. In this connexion it would be interesting to examine the male hypopygium of *S. maculipennis*, a species unfortunately only known in the female.

The other New Zealand species has white ringed tibiae and is similar, especially in hypopygial structure to the Patagonian species *pulchripennis* Edwards, except that its squama appears to be quite bare.

KEY TO NEW ZEALAND SPECIES OF *Diplocladius*

Wings with a single dark band containing a pale area in the anal cell (Pl. XI, fig. *h*) *pictus* sp. n.

Wings with two, browner bands, the outer containing at least one pale area, which is in cell M_2, and often two or three (Pl. XI, fig. *g*) . . . . *lacuniferus* sp. n.

Diplocladius lacuniferus sp. n.

A brownish species with white rings on the tibiae ; wings with two dark bands, the outer including pale areas, costa retracted, squama bare. Male hypopygium similar to that of *D. pulchripennis* Edwards, wing markings differ from that species by the more extensive basal band and the pale lacunae in the outer band.

Male. Wing length 2 mm.

Head, mouthparts and antennae brown, face yellow, eyes densely pubescent, A.R. about 0·8. *Thorax* with yellow background ; stripes, postnotum and sternopleuron blackish, dorso-central bristles well formed and erect. *Legs* brownish, each tibia with a broad central white band occupying rather more than one-third of the segment ; L.R. about 0·7, pulvilli and tarsal beard absent. *Wings* (Pl. XI, fig. *g* of female) with two broad transverse dark bands ; outer band not as extensive as in female and not reaching the apex of M_{3+4}, in cell R_5 there is a browner area and in cell M_2 an almost clear oval area ; basal band reaching forward across the basal cells to the radius ; costa retracted, squama apparently quite bare, halteres yellow. *Abdomen* brown, hypopygium pale. Hypopygium (Text-fig. 2, *c*) not unlike that of *pulchripennis* Edwards ; short anal point present, coxite with elongate and hardly noticeable lobe, styles oval and without apical spine, basal branch present.

Female differs from male in colour of mesonotal stripes, the central ones being yellowish margined with brown, whilst the lateral ones are brown. Wing markings more extensive, as in Pl. XI, fig. *g*.

Holotype male and 3 ♀, CANTERBURY : Cass, xi–xii.1924 (*A. Tonnoir*) ; holotype in the Canterbury Museum.

Diplocladius pictus sp. n.

A very small species, body and halteres brown, legs yellow, wings with a broad blackish cross-band containing a pale area in the anal cell ; costa retracted, eyes pubescent, male styles double, anal point absent.

The male hypopygium of this species is similar to that of *D. lacuniferus* sp. n. and *pulchripennis* Edwards, differing in the complete absence of anal point and the differently shaped style. It is interesting because of the unringed tibiae, bare squama and retracted costa.

Male. Wing length 1·2 mm.

Head and mouthparts brown, antennae yellow, pedicel partially brown, A.R. only 0·3, last segment somewhat clubbed ; eyes densely pubescent. *Thorax* dark brown and matt. *Legs* yellow, pulvilli absent, L.R. 0·6. *Wings* (Pl. XI, fig. *h*) heavily marked with a broad dark brown or blackish cross-band, leaving a clear space near the apex of the anal cell ; costa retracted, slightly produced, posterior fork long, Cu_1 bent, anal vein reaching beyond fork, anal angle absent, squama bare. Halteres with dark knobs and pale stems. *Abdomen* dark brown or blackish. Hypopygium (Text-fig. 2, *b*) lacking anal point, coxite lobe fairly conspicuous and hairy ; style with an apparent extra segment at base carrying a narrow process, apical spine absent.

Female not known.

Holotype male WELLINGTON : Ohakune, iv.1923 (*T. R. Harris*) in the British Museum.

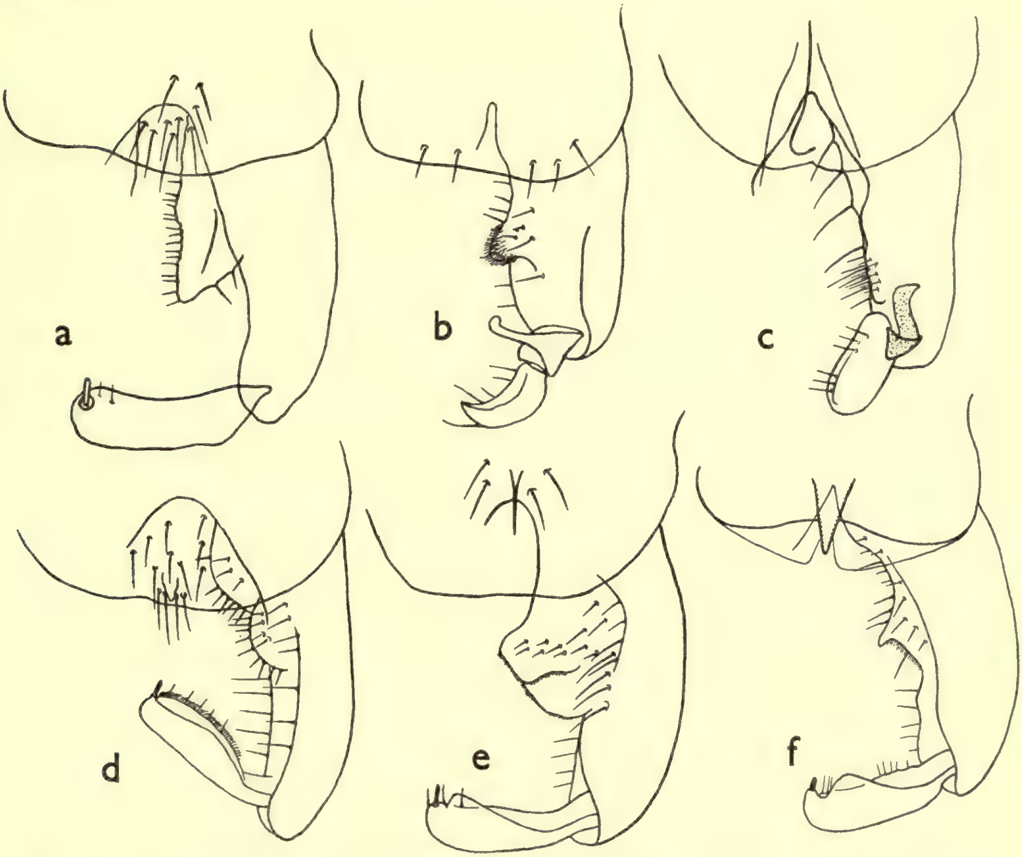

FIG. 2. Male hypopygia of Orthocladiinae. (*a*) *Metriocnemus lobifer* ; (*b*) *Diplocladius pictus* ; (*c*) *D. lacuniferus* ; (*d*) *Chaetocladius harrisi* ; (*e*) *Orthocladius pictipennis* ; (*f*) *Smittia verna*.

Genus ***CHAETOCLADIUS*** Kieffer

Chaetocladius Kieffer, 1911, *Bull. Soc. ent. France*, **1911** : 182 ; Freeman, 1956, *Bull. Brit. Mus. (nat. Hist.) Entom.* **4** : 325.

Spaniotoma subg. *Orthocladius* Groups A and B, Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 337–338.

Eyes bare ; humeral pits small, dorso-central hairs long and erect, their punctures easily visible ; wing membrane with distinguishable microtrichia, usually visible under the low power of the microscope, readily distinguishable under a higher power ; squamal fringe present ; scutellum slightly and uniformly shining, the smooth bare area at its base scarcely distinguishable ; empodium distinct ; Cu usually more or less straight, not sharply bent, anal lobe normally developed.

Although I have seen material of three or four species of this genus from New Zealand, I am only able to describe one species here because the others are represented by females only and the descriptions would be unsatisfactory for later recognition of the species.

Chaetocladius harrisi sp. n.

Uniformly brown, female antennal sensory hairs simple, costa slightly produced, posterior fork beyond r-m, squama with complete fringe, anal point of male practically absent.

Male. Wing length 1·6 mm.

Head, mouthparts and antennae brown, eyes bare, A.R. 1·0. *Thorax* uniformly brown, dorso-central bristles uniserial, but more numerous on shoulders. *Legs* brown, pulvilli absent, L.R. 0·75. *Wings* with distinguishable microtrichia ; costa slightly produced, posterior fork well beyond cross-vein, Cu_1 slightly curved, anal lobe obtuse, squama with complete fringe. *Abdomen* uniformly brown, hypopygium (Text-fig. 2, *d*) with anal point hardly indicated, IXth tergite with a cluster of long hairs at that position, coxite lobe small, style with rather strongly developed microtrichia.

Female very similar to male in general structure, in one specimen paler on shoulders and around wing base ; antennal segments almost cylindrical, segment 6 about one and a half times as long as 5, sensory hairs simple.

Holotype male, xii.1922 and 1 ♀, v–vii.1923, WELLINGTON : Ohakune (*T. R. Harris*) both in the British Museum.

Genus ***ORTHOCLADIUS*** Wulp

Orthocladius Wulp, 1874, *Tijdschr. Ent.* **17** : 132 ; Freeman, 1956, *Bull. Brit. Mus.* (*nat. Hist.*) *Entom.* **4** : 330.

Spaniotoma subg. *Orthocladius* Groups C–F, Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 344–350.

Eyes bare ; wing membrane without distinguishable microtrichia even under a 1/6-in. objective, usually at least slightly purplish or brownish ; smooth bare area at base of scutellum usually sharply marked off from dull apical area ; empodium variable, pulvilli absent ; squama fringed, R_{2+3} ending distinctly in costa, clearly separated from R_{4+5}.

Two described species, *Orthocladius publicus* Hutton and *Dactylocladius commensalis* Tonnoir belong here, but such material as I have seen is in too poor a condition for me to offer redescriptions of them. I have seen also females of two other species but before a proper revision can be undertaken there must be much more collecting and a thorough examination of type material. I am, however, able to describe an unusual species with heavily patterned wings, a character which distinguishes it from other New Zealand species of the genus. The larva of *O. commensalis* Tonnoir is to be found living as a commensal on the ventral surface of larvae of species of Blepharoceridae.

Orthocladius pictipennis sp. n.

Black with brown legs and dark halteres, thorax with central stripe shining and lateral ones matt ; wings strongly marked with two broad blackish transverse bands ; pulvilli absent ; M_{1+2} with a row of macrotrichia ; anal point of male absent.

This species is unusual for the subfamily in having strongly patterned wings. Wing patterns are to be seen in some species of *Diplocladius*, in an African species of *Smittia* (see above under genus *Diplocladius*) and also in *Orthocladius calomicra* Edwards from South Chile. It differs from the last species in the absence of pulvilli, in the approximation of the radial veins as well as in the quite different wing pattern and body colour. The prothorax is more reduced centrally than is usual.

Male. Wing length 2 mm.

Head, mouthparts and antennae black or very dark brown, eyes bare, A.R. 1·3. *Thorax* totally black, central stripe slightly shining, lateral stripes and prescutellar area matt, dorso-central bristles uniserial, pits very distinct. *Legs* brown, trochanters and bases of femora yellowish, tarsi yellowish brown, anterior tarsi missing, pulvilli absent, empodium well developed. *Wings* (Pl. XI, fig. *i*) heavily marked with two broad blackish bands as shown ; microtrichia indistinguishable, squama fully fringed, R_1 and R_{4+5} very close, obliterating R_{2+3} ; costa strongly produced, Cu bent, An ending opposite posterior fork ; M_{1+2} carrying a row of macrotrichia on the apical half ; halteres black. *Abdomen* black, not shining, hypopygium (Text-fig. 2, *e*) without anal point but with a ridge in its position, coxite lobe prominent, styles with flange near apex.

Female resembles male in general features ; antennae with six segments, segments 3–5 with well-formed necks ; wing markings more extensive and encroaching much more on wing tip.

Holotype male, xi–xii.1923 and 1 ♂, i.1924 WELLINGTON : Ohakune (*T. R. Harris*) both in the British Museum. WESTLAND : Lake Moana, 2 ♂, 2 ♀, xii.1925 (*A. Tonnoir*) in the Canterbury Museum.

Genus *SMITTIA* Holmgren

Smittia Holmgren, 1869, *K. Svensk. Vet. Akad. Handl.* **8** : 47 ; Freeman, 1956, *Bull. Brit. Mus. (nat. Hist.) Entom.* **4** : 346.

Camptocladius van der Wulp, 1874, *Tijdschr. Ent.* **17** : 133 (in part) ; Hutton, 1902, *Trans. New Zealand Inst.* **34** : 185.

Spaniotoma subg. *Smittia* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 357.

Eyes bare or with short pubescence ; wings without distinguishable microtrichia, often rather milky ; R_{2+3} ending separately in the costa ; posterior fork well beyond cross-vein, Cu often rather strongly curved ; squama always quite bare, pulvilli usually absent.

There are representatives of three or four species in the British Museum but only one, a previously described species, includes males. I am unwilling to describe the remainder without figuring the male hypopygium.

Smittia verna Hutton

Camptocladius vernus Hutton, 1902, *Trans. New Zealand Inst.* **34** : 185.

Thorax blackish, slightly shining, eyes pubescent, posterior fork long, Cu_1 bent, Cu_2 with false additional fork, anal vein long, male hypopygium with short anal point. I have seen cotypes of this species both from the Canterbury and British Museums.

Male. Wing length 1·75 mm.

Head, mouthparts and antennae dark brown or blackish, eyes densely pubescent, A.R. 1·6. *Thorax* uniformly blackish, slightly shining. *Legs* brown, pulvilli absent, L.R. 0·6. *Wings* without markings, squama bare, anal angle moderate, not right-angled ; costa produced, posterior fork long, Cu_1 bent, Cu_2 with accessory false fork, anal vein long and curved. *Abdomen* uniformly dark brown, hypopygium (Text-fig. 2, *f*) with short, conical anal point, moderate coxite lobe, and flanged style.

Female similar to male.

Type series in the Canterbury Museum, cotypes in the British Museum.

DISTRIBUTION. AUCKLAND : Paiaka, 2 ♂, xi–xii.1949 (*R. A. Cumber*) ; Mount Albert, 3 ♂, 4 ♀, v.1915 (*A. E. Brookes*). WELLINGTON : Ohakune, 1 ♂, 2 ♀, xi.1922 and v–vii.1923 (*T. R. Harris*). CANTERBURY : type series, males and females and other specimens, Christchurch ; Governor's Bay, 1 ♂, ix.1922 (*J. F. Tapley*). OTAGO : Dunedin, 1 ♂, 1 ♀ (*C. C. Fenwick*).

SUBFAMILY CHIRONOMINAE

Eyes with dorsal narrow portion (except in *Pseudochironomus* and in one or two other non-New Zealand genera) ; male antennae plumose and with 11–14 segments, female antennae with five to seven segments. Pronotum sometimes collar-like, but often reduced and not visible from above, postnotal furrow distinct. Anterior tibia usually terminating on the inner side in a " scale ", which may be rounded and unarmed or armed with a sharp spine ; in *Riethia* (and the non-New Zealand genus *Pseudochironomus*) there is a conspicuous spur on this tibia ; middle and posterior tibiae normally with two apical combs composed of basally fused spinules, the tibial spurs are associated with these combs but one or both spurs may be reduced or absent and the combs may be fused or separate. Anterior basitarsus at least as long as, and nearly always longer than, the tibia (L.R. more than 1). True base of M_{3+4} (m-cu of authors) never present, R_{2+3} present, but never connected to R_1 by a cross-vein ; costa almost always ending abruptly at tip of R_{4+5}. Male hypopygium not inverted, styles directed rigidly backwards and without terminal spine, coxites usually with two or more basal appendages (reduced and occasionally absent in *Chironomus* subg. *Cryptochironomus*).

There are descriptions of seven species of this subfamily in the literature, six being placed by their authors in *Chironomus* and one in *Tanytarsus*. *Chironomus zealandicus* Hudson and *novae-zelandiae* Kieffer, from an examination of compared specimens and cotypes, have been found to be descriptions of the same species which belongs to *Chironomus sensu stricto*. I have seen cotypes of *C. opimus*, *pavidus* and *ignavus* Hutton and find that all belong to *Polypedilum* ; the first two I have been able to recognize easily from my material, but of *ignavus* I have only seen two damaged females which may belong to my new species *P. canum* but cannot be identified with certainty. I am unable to recognize *C. lentus* Hutton of which I have seen no type material and Dr. Pilgrim tells me that there is no material of this species in the Canterbury Museum so far as he can see : it is very probably another species of *Polypedilum.* The species of *Tanytarsus* belongs to that genus and is redescribed below.

KEY TO TRIBES AND NEW ZEALAND GENERA OF CHIRONOMINAE

1. Wings with macrotrichia on membrane and with cross-vein r-m parallel to and practically continuous with R_{4+5} ; squama bare
Tribe Tanytarsini—only one genus represented—*Tanytarsus* Wulp
Wings usually without macrotrichia on the membrane, when present, then r-m transverse ; squama usually fringed—Tribe Chironomini 2
2. Posterior tibia with only a single spur which is normally carried on the small outer comb in those species in which the combs are not fused 3
Posterior tibia with two spurs, that is, each comb with a spur 4
3. Pulvilli easily visible in a dry specimen, in a slide mount they can be seen to be divided longitudinally ; anterior tibial scale usually with a small spur ; eighth abdominal segment of male constricted basally . . . . *Polypedilum* Kieffer
Pulvilli only discernible in slide mounts, not divided ; anterior tibia lacking both distinct scale and spur ; VIIIth tergite of male abdomen not constricted basally
Paucispinigera gen. n.
4. Wing membrane thickly clothed with macrotrichia . . . . . *Harrisius* gen. n.
Wing membrane without macrotrichia 5
5. Anterior tibial scale rounded and unarmed ; pronotum reaching up to front of mesothorax, sometimes collar-like . . . . *Chironomus* Meigen
Anterior tibia either with a spur or an armed scale 6
6. Anterior tibia with well-formed black spur with enlarged base ; prothorax reaching up to front of mesonotum but narrow and not collar-like ; frons without tufts of coarse forwardly projecting hair . . . . *Riethia* Kieffer
Anterior tibia with small triangular scale bearing a short sharp spine ; prothorax reduced and far surpassed by mesonotum ; frons carrying a group of coarse hair each side, projecting forwards between antennae . . . . *Ophryophorus* gen. n.

Genus ***RIETHIA*** Kieffer

Riethia Kieffer, 1917, *Ann. Mus. nat. Hung.* **15** : 203 ; Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 272 ; Kieffer, 1921, *Ann. Soc. ent. France* **90** : 30.

Male antenna with 14 segments, female with six or seven segments, eyes with well-formed dorsal narrow portions. Prothorax applied to front of mesothorax, not collar-like. Anterior tibia with well-formed black spur, the base being enlarged as in *Pseudochironomus*, other tibiae each with a pair of subtriangular combs carrying a long spur at the apex, pulvilli present or absent. Costa neither produced nor retracted, ending above apex of M_{1+2}, squama with complete fringe. Hypopygium without anal point, two coxite appendages present, appendage 2 in at least some species with stout pectinate spines.

Kieffer described this genus to include two Australian species, but he did not designate either as type species. I have been unable to find any subsequent designation and I therefore designate *Riethia stictoptera* Kieffer, 1917 as the type species.

Australian material of *R. stictoptera* and Kieffer's original description show that the genus is allied to *Pseudochironomus* in spur formation but possesses well-formed dorsal narrow portions to the eyes. The Australian specimens and the New Zealand species described below show similar spurs and eyes and, in addition differ from *Pseudochironomus* in the much reduced prothorax which is hardly visible from above and is applied to the front of the mesothorax much as in *Chironomus* subgg. *Cryptochironomus* and *Dicrotendipes* ; also the costa is not retracted.

The New Zealand species is extremely similar to the South Chilean *Pseudochironomus truncatocaudatus* Edwards, and I am therefore transferring this species and *melanoides* Edwards, also from Chile, to *Riethia*. The Chilean species have no pulvilli, the New Zealand species small ones, whilst in the Australian species they are well developed, illustrating that this character is not of generic significance in this part of the family.

Riethia zeylandica sp. n.

Greenish with reddish thoracic markings and plain wings. In the structure of the male hypopygium and the spurs it resembles the South Chilean species *truncatocaudata* Edwards (see above), but it differs in the presence of distinct pulvilli, by the seven-segmented female antennae, by the smaller size, by the shape of appendage 1 of the male hypopygium and the smaller number of pectinate spines on appendage 2.

Male. Wing length 2·3–2·6 mm.

Head green, mouthparts brownish, pedicel reddish, A.R. 1·3, eyes with well-formed dorsal narrow portions. *Thorax* green ; stripes, postnotum and sternopleuron reddish brown ; dorso-central bristles uniserial, prothorax narrow and closely applied to front of mesothorax. *Legs* greenish brown, L.R. slightly more than 1, distinct pulvilli present. *Wings* unmarked ; costa not produced nor retracted, ending above M_{1+2}, posterior fork slightly distal to cross-vein, halteres pale. *Abdomen* green and without darker markings. Hypopygium (Text-figs. 3, *a*, *a'*) similar in general structure to *truncatocaudata* but differs as follows : margin of IXth tergite with only four long hairs, styles more pointed, appendage 1 rounded and not pointed at the apex, appendage 2 with only about six flattened pectinate spines which are placed at the extreme tip.

Female similar to male in colour and general structure ; antennae with seven segments.

Holotype male and 4 ♂, 3 ♀, WELLINGTON : Ohakune, xi.1922 (*T. R. Harris*) all in the British Museum.

Genus ***CHIRONOMUS*** Meigen

Chironomus Meigen, 1803, *Illiger's Mag.* **2** : 260 ; Freeman, *Bull. Brit. Mus. (nat. Hist.) Entom.* **5** : 329.

Dicrotendipes Kieffer, 1913, *Voy. Alluaud Jeannel Afr. Or. Ins. Dipt.* **1** : 23.

Cryptochironomus Kieffer, 1918, *Ent. Mitt.* **7** : 46.

Chironomus subg. *Chironomus* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 380.

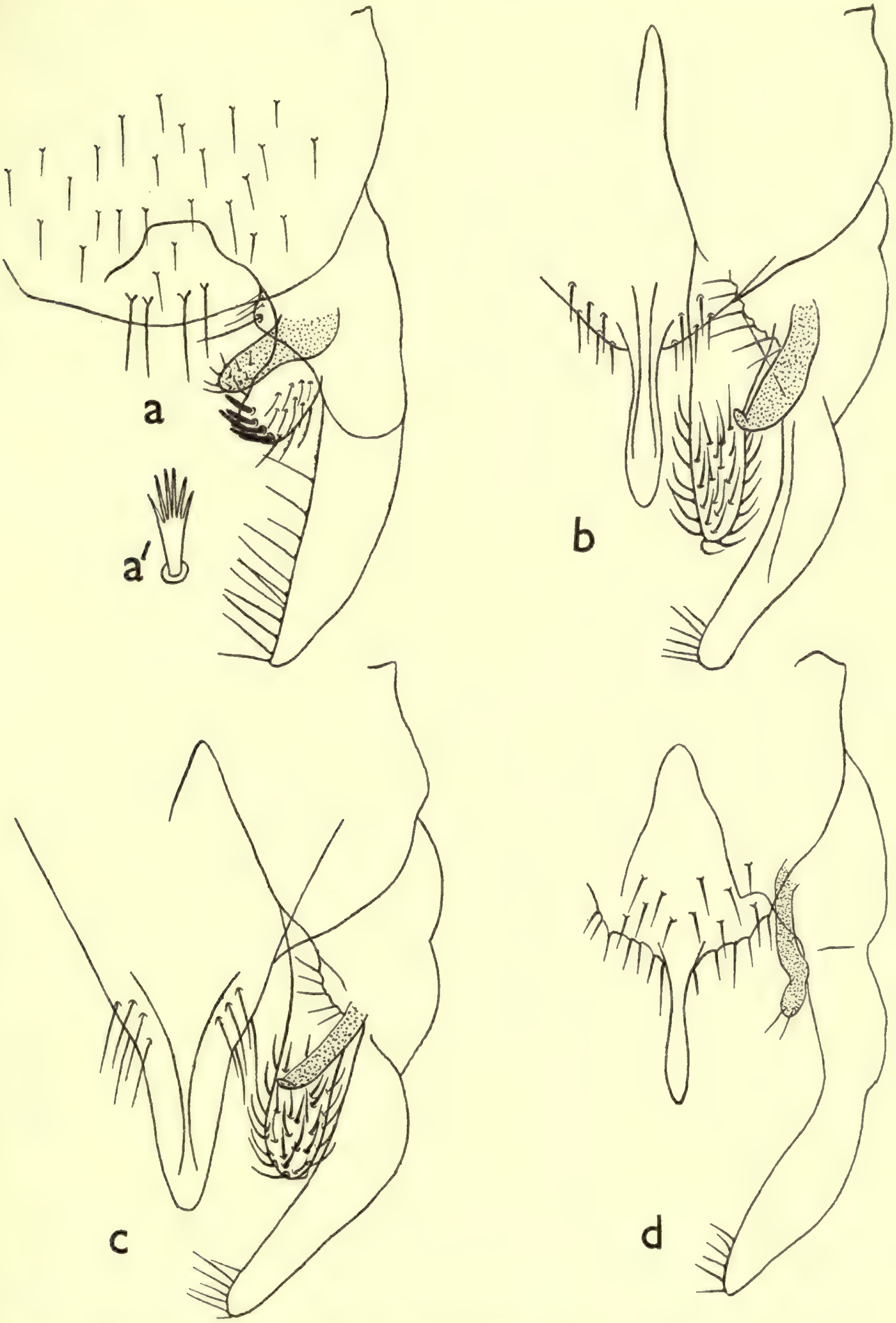

FIG. 3. Male hypopygia of *Rietha* and *Chironomus*. (*a*) *R. zeylandica*; (*a′*) spine from apex of appendage 2 at higher magnification; (*b*) *C.* (*Chironomus*) *zealandicus*; (*c*) *C.* (*Chironomus*) *analis*; (*d*) *C.* (*Cryptochironomus*) *cylindricus*.

Male antenna with 12 segments and that of female usually with six ; frontal tubercles frequently present ; palpi usually long. Prothorax reaching up to front of thorax where it may form a collar with or without central emargination ; often with a centrally dividing suture but the two halves are close together and not widely separated. Anterior tibia with rounded, unarmed scale, combs of middle and posterior tibiae large and each with a short spur ; pulvilli large and broad. Wing membrane without macrotrichia, squama with complete fringe.

Four New Zealand species of *Chironomus*, falling into three subgenera are known to me but doubtless others remain to be found. All are quite typical of the groups to which they belong. Six species have been placed by previous authors in the genus, but, as stated above, it is probable that only two of these really belong here.

KEY TO NEW ZEALAND SPECIES OF *Chironomus*

1. Prothorax collar-like and with a well-marked V-shaped central emargination ; frontal tubercles present (*Chironomus s. str.*) 2
   Prothorax narrower and applied to front of mesonotum, with a centrally dividing suture ; frontal tubercles absent 3
2. Anal point of male narrow (Text-fig. 3, *b*) . . . . *Ch.* (*Ch.*) ***zealandicus*** Hudson
   Anal point of male stout (Text-fig. 3, *c*) . . . . . . *Ch.* (*Ch.*) ***analis*** sp. n.
3. Front legs with apex of femur and whole of tibiae and tarsi dark brown *Ch.* (*Dicrotendipes*) ***canterburyensis*** sp. n.
   All legs green with only tarsi darker . . . *Ch.* (*Cryptochironomus*) ***cylindricus*** sp. n.

Chironomus (Chironomus) zealandicus Hudson

Chironomus zealandicus Hudson, 1892, *Manual of New Zealand Entomology*. London, p. 43 ; Hutton, 1902, *Trans. New Zealand Inst.* **34** : 181.
Chironomus novae-zelandiae Kieffer, 1921, *Ann. Soc. Linn. Lyon.* **68** : 146 (***syn. nov.***).

A typical species of the subgenus, very similar to others from other parts of the world. Thorax yellowish or greenish brown with greyish pruinosity and dark stripes ; anterior tarsi bearded, abdominal segments dark and with apical third yellowish or greenish, hypopygium with narrower anal point than in the next species.

Male. Wing length 4–6 mm.

Head yellowish or greenish brown, mouthparts dark brown, frontal tubercles present, antennae dark brown, A.R. about 4. *Thorax* with yellowish brown background, shoulders and lateral margins paler ; stripes, postnotum and sternopleuron dark brown, prescutellar area usually brown as well ; whole thorax with slight greyish pruinosity. *Legs* yellowish or greenish brown, dark only at tips of tarsi ; anterior tarsus well bearded, L.R. 1·3. *Wings* with darkened cross-vein, halteres yellow. *Abdomen* usually dark brown with about apical third of each segment yellowish or greenish and slightly pruinose, but the size of the pale parts varies and may be greater or lesser ; hypopygium (Text-fig. 3, *b*) of a very normal *Chironomus plumosus* type, anal point narrower than in *analis* sp. n.

Female very similar to male, but abdomen darker and rather more pruinose ; anterior tarsi not bearded.

I have not seen Hudson's type specimens which are in the Dominion Museum, Wellington, but I have seen a number identified by Hutton who would presumably have had access to the Hudson Collection ; type locality, Christchurch. The type series of *novae-zelandiae* is in the Berlin Museum and I have been able to borrow some of these ; I have marked a male from Wellington as lectotype.

Distribution. It is a common species and I have seen about 100 specimens from the following localities. Auckland : Paiaka, Mt. Albert, Tamaki, Wairoa. Wellington : Ohakune, Makerua. Nelson : Blackball. Westland : Otira, " West Coast ". Canterbury : Christchurch, Governor's Bay, New Brighton, Rolleston, " S. Canterbury ".

Chironomus (Chironomus) analis sp. n.

This species is very similar to *zealandicus* in general appearance, but the male anal point is much heavier and stouter (Text-fig. 3, *c*). In colour it tends to be rather paler and the male abdomen is green with a saddle-shaped dark mark placed in the basal two-thirds of each of segments 2–5. In other structural features the two species are identical.

Holotype male Nelson : Blackball, v.1920 (*J. W. Campbell*). Wellington : Ohakune, 1 ♂, 3 ♀ (*J. W. Campbell* and *T. R. Harris*). Westland : W. Coast, 1 ♂, ii.1925 (*T. R. Harris*). Otago : Queenstown, 1 ♂, xii.1919 (*T. R. Harris*). All specimens are in the British Museum.

Chironomus (Dicrotendipes) canterburyensis sp. n.

Thorax yellowish green and shining with three dark brown well separated stripes, bristles dark ; front tibiae and tarsi dark brown, all femora dark at tips ; abdomen plain green with dark bristles. Although the male is not known, I am describing this species because it should be easily recognized by the colour and pattern. It is the only species of the subgenus known to me from New Zealand.

Female. Wing length 4 mm.

Head, mouthparts and antennae brown, pedicel yellow ; segments 2–5 of antennae with long narrow necks which are almost as long as basal bulbs, segment 6 one and a half times as long as 5, frontal tubercles absent. *Thorax* shining yellowish green ; stripes and apical half of postnotum dark brown, stripes separate, prescutellar area green ; dorso-central bristles uniserial anteriorly, both they and lateral bristles dark brown and rather conspicuous against the pale background. *Legs* with green femora tipped with brown, front tibiae and tarsi entirely dark brown, tibiae of posterior four legs green tinged with brown, tarsi of these legs brown ; L.R. 1·5 ; pulvilli well developed, fifth segment of anterior tarsus half as long as fourth and cylindrical, tibial combs wide, spurs short. *Wings* plain, squama fringed, R_{2+3} ending in contact with R_1, halteres green. *Abdomen* plain green with brown bristles.

Holotype female and 2 ♀, South Canterbury, ii.1923 (*T. R. Harris*), all in the British Museum.

Chironomus (Cryptochironomus) cylindricus sp. n.

Green with reddish thoracic markings and narrow dark bands at the abdominal incisures of the male ; hypopygium with long, narrow, cylindrical appendage 1.

Male. Wing length 2·5–2·75 mm.

Head green, palpi and antennae brownish, pedicel reddish, A.R. 1·5, frontal tubercles absent. *Thorax* green; stripes, postnotum and sternopleuron reddish yellow, dorso-central bristles uniserial and pale. *Legs* green, tarsi darker, L.R. 1·5, combs fused and each with a short spur. *Wings* plain, squama fringed, halteres green. *Abdomen* green, segments 1–4 each with a narrow dark band at apex, extended slightly on to the base of each succeeding segment so that band is properly at the incisure. Hypopygium (Text-fig. 3, *d*) with characteristic shaped styles, long anal point and cylindrical appendage 1.

Female similar to male but abdomen plain green; antennae with segments 3–5 lacking long necks.

Holotype male South Canterbury, ii.1923 (*T. R. Harris*). AUCKLAND: Paiaka, 5 ♂, 11 ♀, xi–xii.1949 (*R. A. Cumber*), holotype and other specimens all in the British Museum.

Genus ***HARRISIUS*** gen. n.

Antennae of male with 14 segments, of female with six, although the second segment is deeply indented; frontal tubercles absent, palpi not reduced. Pronotum much reduced and far surpassed by mesonotum which projects as a cone over the head very much as in *Stenochironomus*; acrostichal bristles long and with distinct pits and easily visible as a double row extending back to middle of scutum. Wing membrane thickly clothed with macrotrichia, squama fringed; R_{2+3} close to R_1 at the apex. Scale of anterior tibia oval and rather longer than in *Chironomus s. str.* but not as long as in *Stenochironomus*, without a spur; pulvilli present; combs of middle and posterior tibiae fused and each with a spur. Male hypopygium with two pairs of coxite appendages and without the lengthening of appendage 2 and style shown by *Stenochironomus*, appendage 2 also lacks a movable spine at the apex.

Type of genus *H. pallidus* sp. n.

In general appearance and in most of its characters this genus resembles *Stenochironomus* but it is to be distinguished by the hairy wings and differently constructed male hypopygium. There are specimens of another, as yet undescribed, species in the British Museum from New Guinea.

Harrisius pallidus sp. n.

A small pale green species with yellowish thoracic markings; readily distinguished from other New Zealand Chironomids by the hairy wings and the male genital structure.

Male. Wing length 2·5–2·75 mm.

Head, mouthparts and antennae greenish yellow, A.R. 1·5. *Thorax* very pale greenish yellow; stripes, postnotum and sternopleuron yellow. *Legs* greenish white; anterior tibia subequal to femur, L.R. 1·2, beard absent. *Wings* quite unmarked and with macrotrichia almost to the base, halteres white. *Abdomen* pale green, hypopygium (Text-fig. 4, *a*) simple, appendage 1 rather long and curved, appendage 2 with a few apical bristles.

Female similar to male.

Holotype male and 4 ♂, 10 ♀, WELLINGTON: Ohakune, x.1922–iii.1923 and xi.1923 (*T. R. Harris*). AUCKLAND: Kaitaia, 1 ♂, ii.1917 (*J. Muggeridge*); Tuakau, 2 ♀, ii.1917 (*J. Muggeridge*). WESTLAND: Lake Moana, 2 ♂, xii.1925 (*A. Tonnoir*). CANTERBURY: Christchurch, R. Purau, x.1922 (*J. W. Campbell*); Cass, 2 ♂, 2 ♀, xii.1924 (*A. Tonnoir*); Hilltop, 2 ♀, i.1925 (*A. Tonnoir*). Specimens collected by Tonnoir are in the Canterbury Museum, holotype and remainder are in the British Museum.

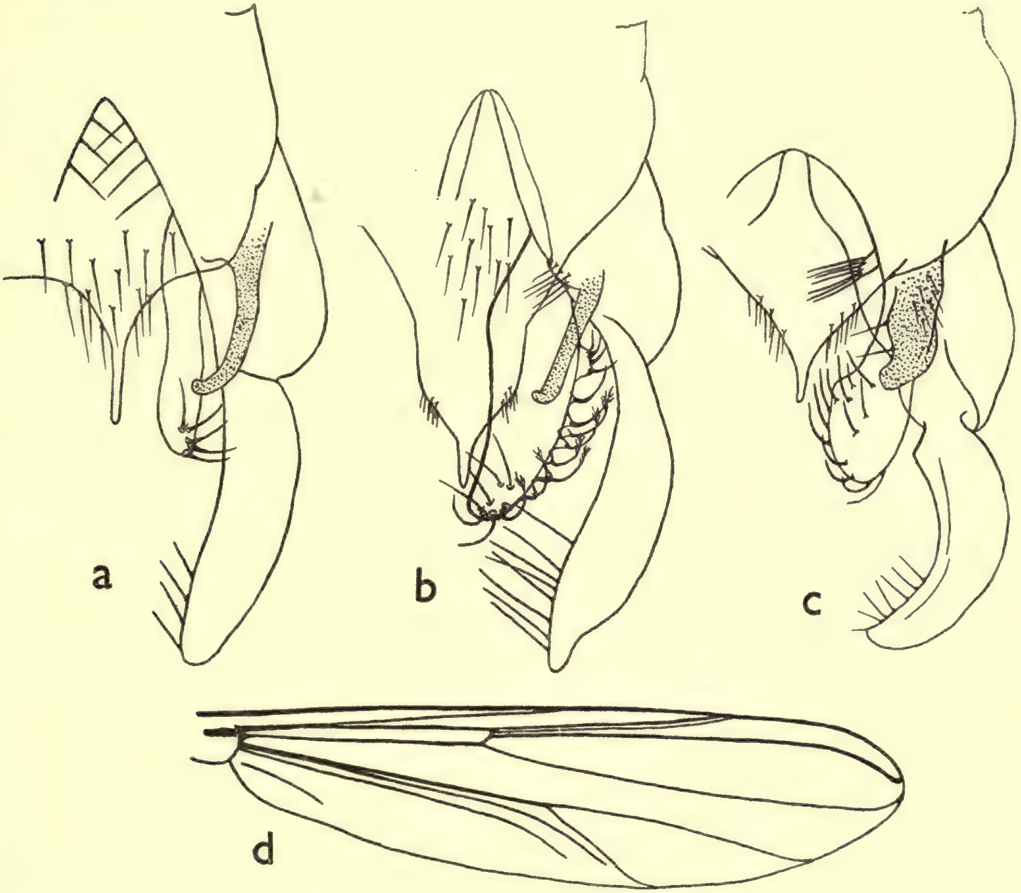

FIG. 4. Chironominae. (*a*) Male hypopygium of *Harrisius pallidus*; (*b*) hypopygium of *Ophryophorus ramiferus*; (*c*) hypopygium of *Paucispinigera approximata*; (*d*) wing of *P. approximata*.

Genus ***OPHRYOPHORUS*** gen. n.

Antennae of male with 14 segments, of female with six and segment 2 is deeply indented; frontal tubercles absent, but frons with a group of long coarse hairs each side projecting forwards between antennae; palpi not reduced. Pronotum much reduced and surpassed by mesonotum which projects as a cone over head as in *Stenochironomus* and *Harrisius*; acrostichal bristles long, arising from distinct pits and easily visible as a double row extending back to middle of scutum. Wing membrane without macrotrichia, squama fringed, R_{2+3} close to R_1 at apex. Scale of anterior tibia not very large, triangular and with a short sharp spine at the apex; pulvilli present; combs of middle and posterior tibiae fused and each fused pair carrying two spurs. Male hypopygium with two pairs of coxite appendages, the hairs on appendage 2 of the type species branched at the apices.

Type species of the genus *O. ramiferus* sp. n.

The single species placed in this genus bears a resemblance in thoracic structure to *Stenochironomus* and *Harrisius*, but it can be distinguished from the former by the quite different male hypopygium, from the latter by the bare wings and from them both by the two groups of coarse hairs on the frons.

Ophryophorus ramiferus sp. n.

Thorax pale with reddish stripes, abdomen very dark brown, distinguished from other New Zealand Chironomids by the generic characters and by the male hypopygium with its curious branched hairs.

Male. Wing length 3 mm.

Head yellowish, antennae brown, A.R. about 1·8. *Thorax* pale yellow; stripes reddish, sternopleuron and postnotum brown. *Legs* yellow, apices of anterior femora and tibiae slightly darkened, tarsal beard absent, L.R. 1·3. *Wings* unmarked, costa rather long and R_{4+5} curved at the apex. *Abdomen* very dark brown; hypopygium (Text-fig. 4, *b*) quite characteristic; IXth tergite of an unusual shape, with anal point at apex of conical extension of the tergite, appendage 1 simple, appendage 2 with branched hairs along the outer margin, styles contracted at extreme apex.

Female very similar to male but abdomen is pale.

Holotype male and 9 ♂, 13 ♀, WELLINGTON: Ohakune, xi.1922–iv.1923 (*T. R. Harris*) all in the British Museum.

Genus ***PAUCISPINIGERA*** gen. n.

Antennae of male with 14 segments, of female with six, frontal tubercles absent, palpi not reduced. Pronotum not greatly reduced, reaching more or less up to front of mesonotum; acrostichal bristles well developed. R_{2+3} only slightly separated from R_1 at apex, R_{4+5} and costa curved round right to the apex of the wing where they are only slightly separated from M_{1+2} which is curved upwards at the apex; posterior fork well distal to cross-vein; wing membrane without macrotrichia but they are present on M_{1+2} and in the female on M_{3+4} as well; squama fringed. Anterior tibia without either distinct scale or spur, combs of other tibiae fused and each fused pair with only a single spur; pulvilli only visible in slide preparations and not divided, empodium well formed. Male hypopygium very similar in structure to *Paratendipes*, appendage 2a small but distinct; segment 8 not constricted basally.

Type species *P. approximata* sp. n.

From the structure of the male hypopygium this species could easily be placed in *Paratendipes*, but it is precluded from that genus by the presence of only one posterior tibial spur and the absence of an anterior tibial spur. In the presence of macrotrichia on the medial vein and the approximation of R_{4+5} and M_{1+2}, the species resembles *Polypedilum opimus* Hutton but it does not belong to *Polypedilum* because of the reduced and simple pulvilli, the simple apex of the anterior tibia and the unconstricted base of the eighth segment of the male abdomen.

Paucispinigera approximata sp. n.

Green with reddish thoracic markings, easily separated from other species by the approximation of veins R_{4+5} and M_{1+2} with macrotrichia on the latter and by the *Paratendipes*-like male hypopygium.

Male. Wing length 2–2·6 mm.

Head and antennal pedicel yellow, palpi darker, A.R. 1·3. *Thorax* yellowish green with reddish stripes, postnotum and sternopleuron. *Legs* pale yellow, L.R. 1·3. *Wings* unmarked, venation as in Text-fig. 5, *d*, M_{1+2} with macrotrichia on apical half. *Abdomen* plain green, hypopygium as in Text-fig. 5, *c*.

Female similar to male in colour, vein M_{1+2} with macrotrichia for most of its length, macrotrichia also present on M_{3+4} from fork to wing margin.

Holotype male and 9 ♂, 8 ♀, WELLINGTON : Ohakune, x–xii.1922 and iv–vii.1923 (*T. R. Harris*). MARLBOROUGH : Goose Bay, 1 ♂, iv.1925 (*A. Tonnoir*). WESTLAND : Lake Moana, 3 ♂, xii.1925 (*A. Tonnoir*). CANTERBURY : Hilltop, 1 ♂, iv.1923 (*A. Tonnoir*). Specimens collected by Tonnoir are in the Canterbury Museum, holotype and remainder are in the British Museum.

Genus ***POLYPEDILUM*** Kieffer

Polypedilum Kieffer, 1913, *Bull. Soc. Hist. nat. Metz* **28** : 15 ; Freeman, 1958, *Bull. Brit. Mus. (nat. Hist.) Entom.* **6** : 266.

Pentapedilum Kieffer, 1913, *Bull. Soc. Hist. nat. Metz* **28** : 25.

Chironomus subg. *Polypedilum* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 401.

Pentapedilum subg. *Pentapedilum* Edwards, 1929, *ibid.* **77** : 376.

Male antenna 14-segmented, of female six-segmented, frontal tubercles only occasionally present. Pronotum moderately developed, both acrostichal and dorsocentral bristles well developed ; anterior tibial scale with a short spur, middle and posterior tibial spurs with only a single spur for each pair ; pulvilli split longitudinally into narrow lobes (only clearly visible in slide mounts). Wing membrane bare or with macrotrichia and either unmarked or with dark clouds and spots ; squama with complete fringe. Eighth abdominal segment of male constricted basally so as to appear triangular ; anal point well formed, two coxite appendages present or occasionally three, appendage 2 usually with a long terminal hair.

There are seven species of this genus in the material at my disposal, one being a species previously known only from Africa south of the Sahara. Two are species which have already been described by Hutton in the genus *Chironomus*, the other four I am describing as new although it may later be shown that *P. canum* sp. n.

is a redescription of another species of Hutton's—*Chironomus ignavus*. *Chironomus lentus* Hutton may also belong here but I cannot place it without examination of the type series.

All the species are fairly typical of the genus with the possible exception of *opimus*, a species in which vein R_{4+5} is strongly curved and both branches of M carry macrotrichia, features in which it resembles the new genus *Paucispinigera*. However, in other respects, including the split pulvilli and constriction of the VIIIth tergite of the male, it resembles *Polypedilum*. All the species belong to the typical subgenus, subgenus *Pentapedilum* not so far being recorded.

KEY TO NEW ZEALAND SPECIES OF *Polypedilum*

1. Wings with dark markings and clouds 2
   Wings unmarked 4
2. R_{4+5} very strongly curved, both branches of M with macrotrichia (Pl. XI, fig. *l*) *opimus* Hutton
   R_{4+5} practically straight, both branches of M bare 3
3. Wing length 1·3–1·5 mm., wing markings more definite and including a dark spot basal to the cross-vein (Pl. XI, fig. *k*) . . . . *longicrus* Kieffer
   Wing length 3·5–4 mm., wing markings more vague, this spot absent (Pl. XI, fig. *j*) *pavidus* Hutton
4. Abdomen with pale markings or pale with dark markings, costal cell rounded at tip 5
   Abdomen dark brown or black without pale markings, costal cell pointed . . 6
5. Abdominal segments dark with pale markings at apices . . . . . *harrisi* sp. n.
   Abdominal segments pale with dark apical bands . . . . . *digitulus* sp. n.
6. Abdomen blackish and without pruinose bands . . . . . . *cumberi* sp. n.
   Abdomen dark brown or blackish with pruinose bands at apices of segments *canum* sp. n.

Polypedilum (Polypedilum) pavidus Hutton

Chironomus pavidus Hutton, 1902, *Trans. New Zealand Inst.* **34** : 183.

A fairly large and typical blackish species with grey pruinosity on the thorax ; wings with faint grey clouds which are better developed in the female ; R_{4+5} nearly straight ; anterior tarsi of male bearded.

Male. Wing length 3·5–4 mm.

Head, antennae and mouthparts dark brown or blackish, A.R. over 4. *Thorax* blackish with pruinosity on shoulders, along line of dorso-central bristles and on prescutellar area. *Legs* dark brown, tibiae slightly paler, anterior tibial scale apparently unarmed, L.R. 1·25, anterior tarsi with long but scanty beard. *Wings* (Pl. XI, fig. *j* of female) with faint grey spots as shown ; R_{4+5} more or less straight. *Abdomen* blackish and with long pale hairs, each segment pruinose basally but not strikingly so. Hypopygium (Text-fig. 5, *a*) quite normal for the genus.

Female resembles male.

I have seen three specimens of the type series which is in the Canterbury Museum. A male agrees with Hutton's description, but of the two females, one is *Trichocladius pluriserialis* and the other a species of *Chaetocladius*. Type locality, Christchurch.

DISTRIBUTION. AUCKLAND : Paiaka, 1 ♀, xi–xii.1949 (*R. A. Cumber*). WELLINGTON : Ohakune, 3 ♂, 1 ♀, x–xi.1922 (*T. R. Harris*). WESTLAND : Lake Moana,

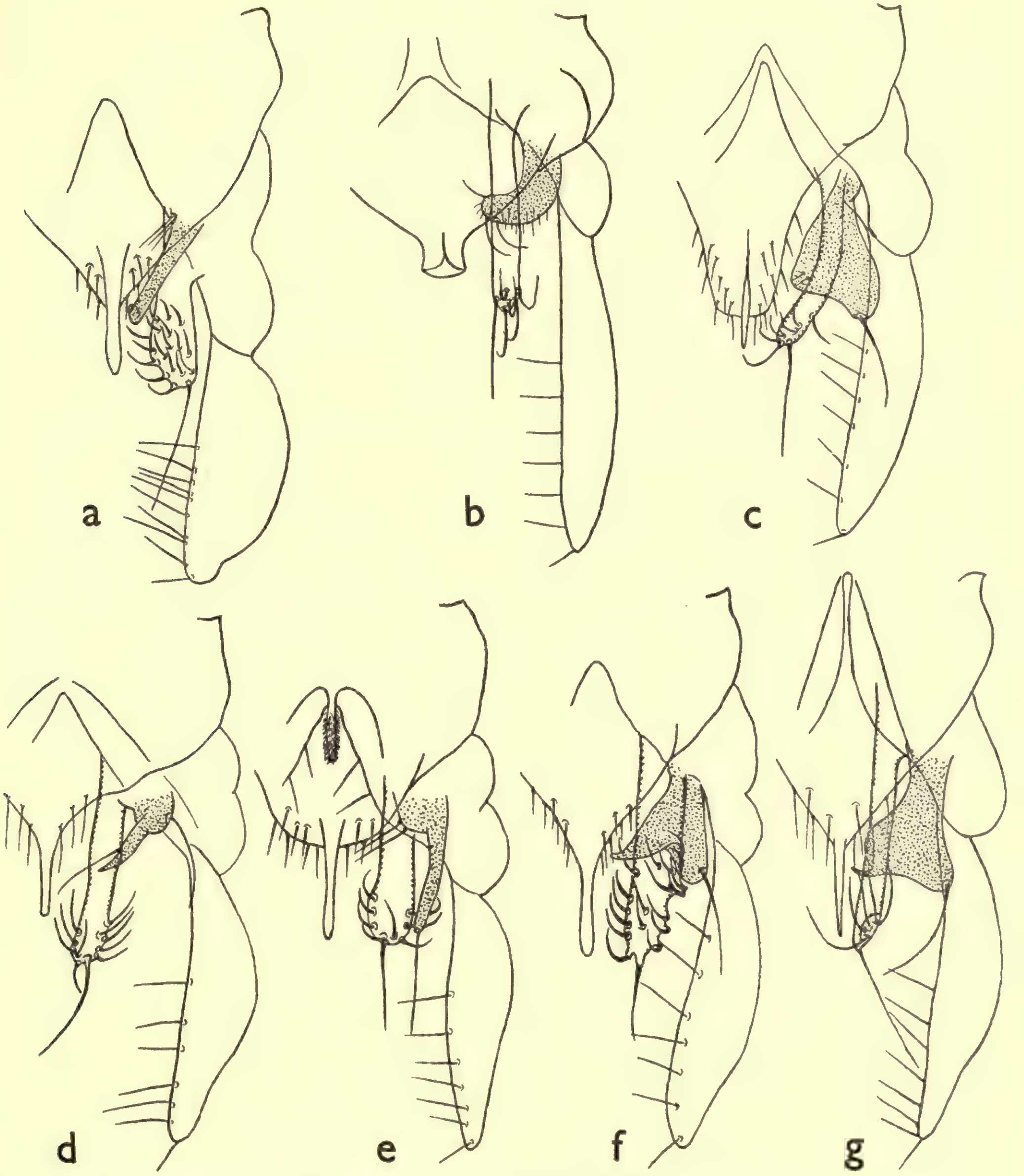

FIG. 5. Hypopygia of *Polypedilum*. (*a*) *P. pavidus* ; (*b*) *P. longicrus* ; (*c*) *P. opimus* ; (*d*) *P. harrisi* ; (*e*) *P. digitulus* ; (*f*) *P. cumberi* ; (*g*) *P. canum*.

1 ♀, xii.1925 (*A. Tonnoir*). CANTERBURY : Christchurch, male of type series and 1 ♂, 1 ♀, x.1924 (*A. Tonnoir*).

Polypedilum (Polypedilum) longicrus Kieffer

Polypedilum longicrus Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 101 ; Freeman, 1958, *Bull. Brit. Mus.* (*nat. Hist.*) *Entom.* **6** : 279.

Polypedilum longicrus has previously been known as an African species and is particularly common along the Nile in the Sudan. The two specimens from New Zealand agree exactly with African material in colour, wing pattern and male hypopygial structure and I can see no reason for separating them as a distinct species. It may have been introduced to New Zealand from Africa, or it may simply be a wide-spread species in the warmer parts of the world. It is a small species with patterned wings, easily distinguished from other New Zealand species by the wing pattern, straight vein R_{4+5} and by the male hypopygium with its broad, sharply down-turned anal point.

Male. Wing length 1·3–1·5 mm.

Head, mouthparts and antennae brown, A.R. about 1·1. *Thorax* brown with some pruinosity especially in prescutellar area. *Legs* yellowish, femora darker basally, tibial scale oval and with short spur, L.R. 1·8, anterior tarsi not bearded. *Wings* (Pl. XI, fig. *k*) with characteristic pattern which includes a spot basal to the cross-vein, R_{4+5} straight ; halteres pale. *Abdomen* dark brown ; hypopygium (Text-fig. 5, *b*) with short broad anal point which is sharply turned downwards, appendage 1 stout and curved, with three longer curved hairs, appendage 2 with about five hairs at the apex.

Female not known from New Zealand material, but in Africa it resembles the male.

The holotype is lost (type locality BELGIAN CONGO : Go).

DISTRIBUTION. AUCKLAND : Paiaka, 2 ♂, xi–xii.1949 (*R. A. Cumber*).

Polypedilum (Polypedilum) opimus Hutton

Chironomus opimus Hutton, 1901, *Trans. New Zealand Inst.* **34** : 182.

Green or yellowish green, thoracic stripes reddish yellow ; abdomen with vague dark markings ; wings with a dark spot over cross-vein and another at apex of anal cell, R_{4+5} strongly curved so that tip of cell almost reaches M_{1+2} which carries macrotrichia ; posterior femora with a dark band near the centre ; IXth tergite of male truncate. This species is easily recognized by the wing pattern and venation, by the band on the femora and by the male hypopygium.

Male. Wing length 2·5–3 mm.

Head, mouthparts and antennae brown, A.R. 1·3. *Thorax* green, mesonotal stripes reddish yellow, each of central ones with a small dark brown line anteriorly, lateral ones with a brown spot just anterior to wings ; postnotum brown on apical half, pleura brown and with a pale longitudinal median stripe. *Legs* yellowish or greenish, anterior tibia dark sub-basally, anterior femora with a broad subapical dark band, other legs usually narrowly dark above and below the knees and with a dark band a little before the middle of the femur ; L.R. 1·25. *Wings* (Pl. XI, fig. *l* of female) with dark clouds over cross-vein and at apex of anal cell, in addition there may be variable and more vague dark markings near the apex ; R_{4+5} and the costa much curved round apex so that they nearly touch M_{1+2} ; both branches of media with macrotrichia on apical half. Halteres yellow. *Abdomen* green, each segment narrowly pruinose at apex and with variable dark markings which may be completely absent. Hypopygium (Text-fig. 5, *c*) with quite characteristic IXth tergite which is drawn out and truncate at apex, anal point curved and finger-like in lateral aspect, appendage 1 bulky in most specimens and with a long seta on the outer angle, but the exact shape is variable and it may be a good deal smaller, appendage 2 narrow and with about six hairs at the apex.

Female resembles male in colour and pattern.

I have seen three specimens of the type series which is in the Canterbury Museum and Dr. Pilgrim has been kind enough to compare further specimens for me (type locality, Christchurch and Auckland).

DISTRIBUTION. AUCKLAND : Paiaka, 5 ♂, 2 ♀, xi–xii.1949 (*R. A. Cumber*). WELLINGTON : Ohakune, 2 ♂, 16 ♀, ii–vii and x–xi.1923 (*T. R. Harris*). CANTERBURY : Christchurch, R. Purau, 2 ♂, x.1922 (*J. W. Campbell*) ; Christchurch, 3 ♂ (*A. Tonnoir*) ; New Brighton, Dyer's Road, 6 ♂, 2 ♀, iv.1922 (*J. W. Campbell*).

Polypedilum (Polypedilum) harrisi sp. n.

Wings plain, mesonotum pale brown, abdomen with yellow markings on segments 1–5, femora dark at apices, R_{4+5} curved ; appendage 1 of male hypopygium narrow and with subapical long hair. The curved radial vein and simple hypopygium are sufficient to distinguish this species from the others described here.

Male. Wing length 3·25 mm.

Head, mouthparts and antennae brown, A.R. 1·8. *Thorax* with pale brown mesonotum lacking pruinosity ; pleura and postnotum dark brown. *Legs* yellowish, apices of femora brown, anterior tarsi missing. *Wings* without markings, R_{4+5} curved but not as strongly as in *opimus*, costal cell rounded at apex ; halteres with dark knobs. *Abdomen* dark brown with yellow markings as broad spots at apices of segments 2–4, segment 1 mostly yellow, segment 5 with narrow yellow band ; markings on segments 1–5 encroach on to base of succeeding segment. Hypopygium (Text-fig. 5, *d*) simple, anal point well formed, appendage 1 narrow though broader basally and with a long subapical seta and another at the base, appendage 2 narrow.

Female not known.

Holotype male WELLINGTON : Ohakune, xi.1923 (*T. R. Harris*) in the British Museum.

Polypedilum (Polypedilum) digitulus sp. n.

Wings plain, R_{4+5} strongly curved but less strongly than in *opimus* ; mesonotum brown and with pruinosity, abdomen yellowish with dark bands at apices of segments. Distinguishable from *harrisi* by the abdominal segments being dark at apices and by the presence of a cylindrical, finger-like process between the coxites of the male.

Male. Wing length 2–2·75 mm.

Head, mouthparts and antennae dark brown, A.R. 1·8. *Thorax* with mesonotum brown with changeable pruinosity, pleura and postnotum dark brown, bristles pale. *Legs* yellow, knees vaguely darkened, L.R. 1·5. *Wings* unmarked, R_{4+5} strongly curved, but not quite as strongly as in *opimus*, costal cell rounded at apex, halteres yellow. *Abdomen* yellowish, each tergite with a dark band at the apex; hypopygium (Text-fig. 5, *e*) not unlike *harrisi* but with an additional finger-like process between the bases of the coxites; appendage 1 rather longer and narrower and with a long hair at the extreme apex.

Female resembles male in colour and wing venation.

Holotype male WELLINGTON: Ohakune, x–xi.1923 (*T. R. Harris*); other specimens with same data, 2 ♂, 2 ♀, x–xi.1922 and 1 ♀ iv.1923 all in the British Museum.

Polypedilum (Polypedilum) cumberi sp. n.

A small blackish species with pruinosity on the mesonotum; wings plain, R_{4+5} curved, costal cell pointed at apex; abdomen dark and unmarked, hypopygium with large bilobed appendage 1. This species is not unlike the next one but it may be distinguished by the plain abdomen as well as by the structure of the hypopygium.

Male. Wing length 2·0 mm.

Head, mouthparts and antennae very dark brown, A.R. only 0·75. *Thorax* black, slightly shining and with pruinosity especially along the lines of dorso-central bristles and in prescutellar area. *Legs* dark brown, L.R. hardly more than 1. *Wings* without markings, R_{4+5} curved but not strongly, costal cell pointed, posterior fork considerably beyond cross-vein, halteres dark. *Abdomen* blackish and shining; hypopygium (Text-fig. 5, *f*) with well-formed anal point, appendage 1 large and bilobed with a long bristle on outer lobe; differing mostly from *canum* by the numerous and strong curved bristles on appendage 2 which is also stouter.

Female resembles male in colour and venation.

Holotype male and 23 ♂, 4 ♀, AUCKLAND: Paiaka, xi–xii.1949 (*R. A. Cumber*) all in the British Museum.

Polypedilum (Polypedilum) canum sp. n.

? *Chironomus ignavus* Hutton, 1902, *Trans. New Zealand Inst.* **34**: 183.

This may be the species described by Hutton as *Chironomus ignavus* of which I have only seen two damaged female cotypes. These enable me to place the species in the correct genus but it is not possible to be certain of the identity of the species until better material, including males, of his series can be examined. *P. canum* is a dark coloured species with blackish abdomen which has pruinose bands at the apices of the segments; wings plain, R_{4+5} curved, cell pointed at the apex. Distinguished from *cumberi* by the pruinose abdominal bands and the reduced number of hairs on appendage 2 of the hypopygium, as well as by the broader appendage 1.

Male. Wing length 3 mm.

Head, mouthparts and antennae brown, A.R. 1·8. *Thorax* brown, lateral mesonotal stripes rather darker brown, with pruinosity especially along lines of dorso-central bristles and in prescutellar area. *Legs* yellowish, slightly darkened at apices of femora, L.R. 1·3. *Wings* unmarked, R_{4+5} curved, costal cell pointed at apex, posterior fork only slightly beyond cross-vein, halteres dark. *Abdomen* very dark brown or blackish, each segment with a band of pruinosity at the apex when viewed from behind. Hypopygium (Text-fig. 5, *g*) with broad appendage 1 which is slightly indented at apex and with a small finger-like process at inner angle, outer angle with a long curved seta ; appendage 2 narrow and with only about six hairs at the extreme apex.

Female resembles male in colour and venation.

Holotype male and 1 ♂, 2 ♀, WELLINGTON : Ohakune, xi.1923 (*T. R. Harris*) all in the British Museum. *C. ignavus* was described from specimens collected at Christchurch.

Genus ***TANYTARSUS*** Wulp

Tanytarsus van der Wulp, 1874, *Tijdschr. Ent.* **17** : 134 ; Freeman, 1958, *Bull. Brit. Mus. (nat. Hist.) Entom.* **6** :

Combs of posterior tibiae at least narrowly separated ventrally and occupying at most half circumference of tibia, usually both with a spur but one or both spurs may be absent. Wing membrane with a variable number of macrotrichia, R_{4+5} ending at level of or beyond tip of M_{3+4}, anal area more or less developed. Scutellum usually with several long marginal bristles but in small species the central pair is the longest.

Both the New Zealand species known to me belong to the subgenus *Tanytarsus s. str.*

KEY TO NEW ZEALAND SPECIES OF *Tanytarsus*

Combs of posterior tibiae unarmed, apex of R_{4+5} opposite apex of M_{3+4} *vespertinus* Hutton

Combs each with a strong spur, apex of R_{4+5} beyond apex of M_{3+4} . *funebris* sp. n.

Tanytarsus (Tanytarsus) vespertinus Hutton

Tanytarsus vespertinus Hutton, 1901, *Trans. New Zealand Inst.* **34** : 185.

Greenish or yellowish, thoracic stripes brown, abdomen olive green, frontal tubercles present, L.R. about 1·5, combs large, occupying half circumference of tibia, unarmed but separated, pulvilli absent, anal point broad and without row of dots, appendage 2 short and with simple hairs, whole hypopygium rather broad.

The formation of the tibial combs makes this species difficult to place in the known genera ; it is precluded from *Micropsectra* and *Lundströmia* because the combs are clearly separated and from *Phaenopelma* because pulvilli are absent. It is probably best placed in the group of *Tanytarsus* to which Edwards (1929) refers as Group A. In this group the tibial spurs are very short and it can, in some ways be regarded as intermediate between the genera *Tanytarsus, Micropsectra* and *Lundströmia*.

Male. Wing length 1·8–2·4 mm.

Head, mouthparts and antennae dark brown, frontal tubercles well developed, A.R. about 1. *Thorax* yellowish, mesonotal stripes brown or occasionally reddish brown, postnotum and sternopleuron darker brown. *Legs* brownish, pulvilli absent, L.R. about 1·5, combs of posterior legs large, occupying about one half of circumference, clearly separated but without spurs. *Wings* fairly well clothed with macrotrichia over most of the surface, costa and apex of R_{4+5} ending opposite apex of M_{3+4}, halteres yellow. *Abdomen* olive green, unmarked ; hypopygium (Text-fig. 6, *a*) with broad anal point lacking row of dots, appendage 1 slightly drawn out at apex, appendage 1a narrow and projecting beyond 1, 2 with comparatively few hairs at apex, 2a short and stout with numerous simple hairs, styles rather blunt and short.

Female resembles male, antennae with six segments.

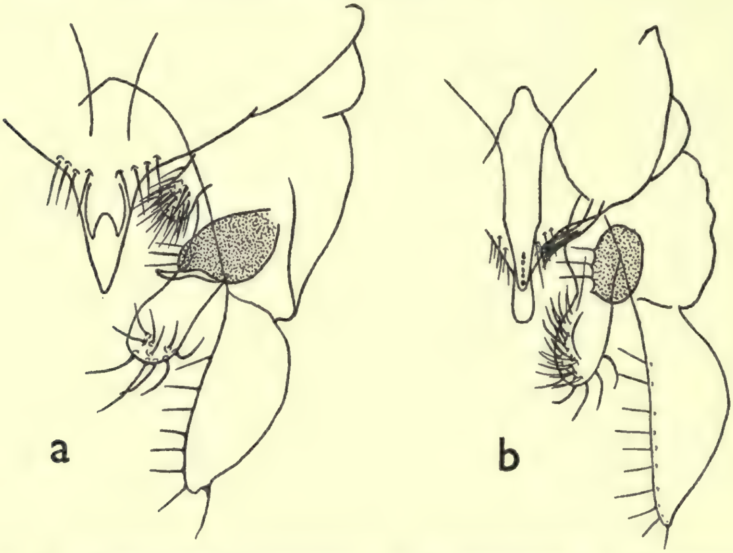

FIG. 6. Hypopygia of *Tanytarsus*. (*a*) *T. vespertinus* ; (*b*) *T. funebris*.

I have seen cotype males in the British Museum and others from the Canterbury Museum (type locality, Christchurch).

DISTRIBUTION. CANTERBURY : Christchurch, cotypes and other specimens ; Cass, 2 ♀, (*A. Tonnoir*) ; Rolleston, 1 ♂, xi.1922 (*J. W. Campbell*). OTAGO : Alexandra, 24 ♂, 12 ♀ (*C. C. Fenwick*).

Tanytarsus (Tanytarsus) funebris sp. n.

A darker species than *vespertinus*, thoracic markings dark brown, abdomen a very dark olive or brownish green ; tibial combs each with a strong spur ; anal point of male with a row of dots, appendage 2a narrow and with a compact brush at apex. This species is much more typical than is *vespertinus* and is not unlike the African *T. nigrocinctus* Freeman, but is easily separated by the absence of markings on the abdomen.

Male. Wing length 2·5 mm.

Head, antennae and mouthparts dark brown, frontal tubercles present and well formed, A.R. about 1. *Thorax* mostly brown or dark brown, slightly pruinose; shoulders, lateral margins and scutellum yellowish, there is some indication of separation of the stripes. *Legs* yellowish brown, anterior tarsi broken, pulvilli absent, tibial combs separate and each with a strong spur. *Wings* with macrotrichia on apical half and as lines of hairs in cells in the more basal part; apex of R_{4+5} beyond level of apex of M_{3+4}. Halteres yellow. *Abdomen* uniformly very dark olive green or brownish green; hypopygium (Text-fig. 6, *b*) with row of dots on anal point, appendage 1 as shown or rather narrower, 1a absent, 2 with numerous hairs, 2a narrow with compact apical brush of hairs.

Female similar to male in colour, wings with denser and more evenly distributed macrotrichia.

Holotype male, South Canterbury, ii.1923 (*T. R. Harris*). AUCKLAND: Paiaka, 1 ♂, 1 ♀, xi–xii.1949 (*R. A. Cumber*). WESTLAND: Lake Moana, 1 ♂, 1 ♀, xii.1925 (*A. Tonnoir*). CANTERBURY: New Brighton, Dyer's Road, 2 ♂, iv.1922 (*J. W. Campbell*). Specimens collected by Tonnoir are in the Canterbury Museum, holotype and remainder are in the British Museum.

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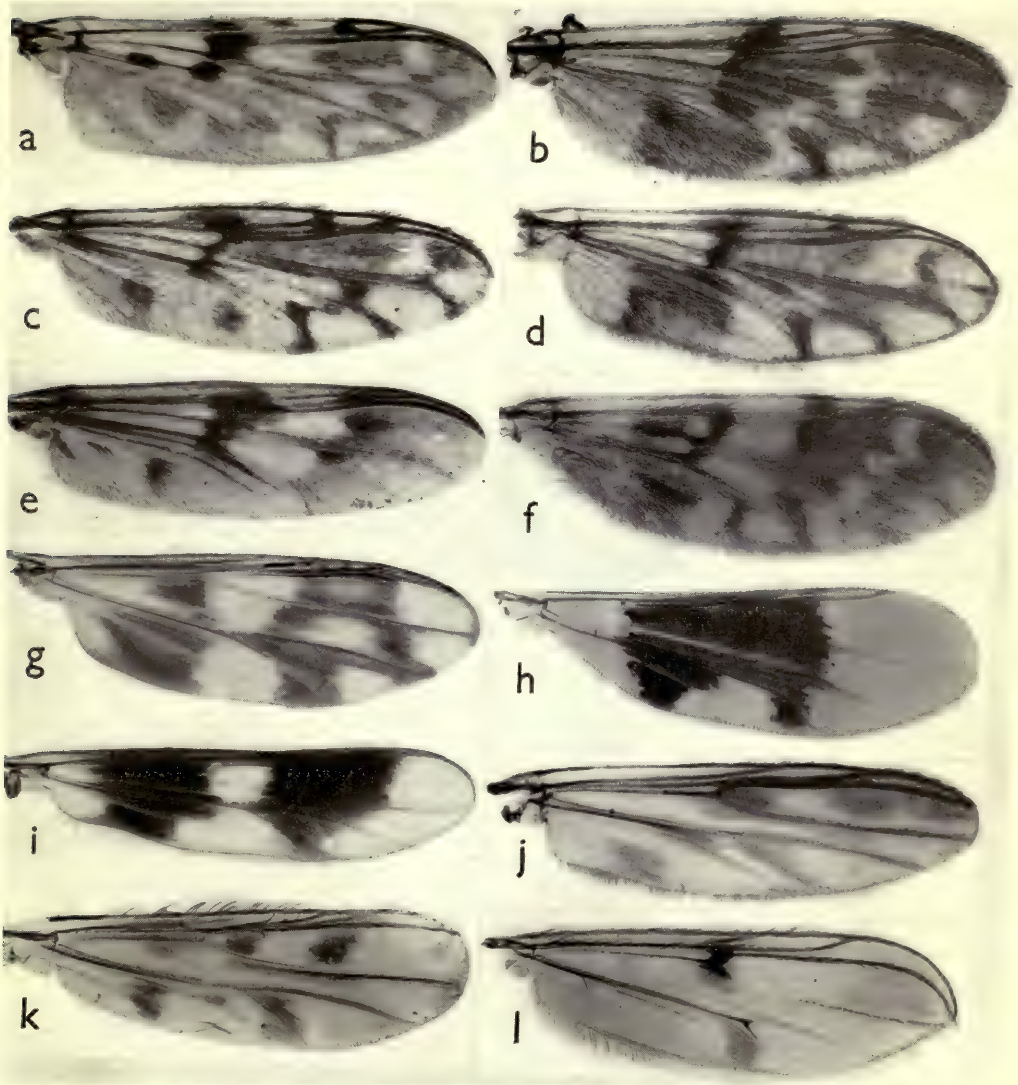
PLATE II

Wings of Chironomidae. (*a*) *Anatopynia antarctica*; (*b*) *A. apicincta*; (*c*) *A. languidus*; (*d*) *A. debilis*; (*e*) *A. umbrosa*; (*f*) *A. quadricincta*; (*g*) *Diplocladius lacuniferus*; (*h*) *D. pictus*; (*i*) *Orthocladius pictipennis*; (*j*) *Polypedilum pavidus*; (*k*) *P. longicrus*; (*l*) *P. opimus*.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